



TOWARDS SUSTAINABLE AGRI-FOOD SYSTEMS: BALANCING BETWEEN MARKETS AND SOCIETY



Agriculture in the bioeconomy: building organizational proximity with territorial biorefineries



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Outline

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2. The concept of Territorial Biorefinery
3. The proximity concept and its importance for the territorial biorefinery
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Introduction

A new paradigm

The sustainable production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy (Bridge 2020, European Commission, 2012)

The KBBE links:

sustainability, renewable resources, economic competitiveness, research priorities and technological innovation

The KBBE is:

the sustainable production and conversion of biomass into various food, health, fiber and industrial products and energy'

such conversion is also sustainable, being efficient, producing little or no waste, and often using biological processing

1. Two business models of biorefineries

Phase I biorefineries

Use one only feedstock, have fixed processing capabilities (single process) and have a single major product

They are already in operation and are proven to be economically viable under certain conditions (policies)

Phase II biorefineries

Can only process one feedstock

Producing various end products (energy, chemicals and materials)

Respond to market demand, prices, contract obligation and the plant's operating limits

Phase III biorefineries

Correspond to the most developed/advanced type of biorefinery

Produce a wide variety of energy and chemical products

Use various types of renewable resources and processing technologies to produce the multiplicity of industrial products our society requires

1. Two business models of biorefineries

Port biorefineries

Based on raw material

Driven mainly by logistics optimization and cost domination

Specialized

Territorial biorefineries

Based on strong relationships with local and regional suppliers

With large range of inputs as well as outputs

2. The concept of territorial biorefinery and its genealogy

Use novel technologies and diverse biomass feedstock—requiring significant investments in research, development, and deployment to reduce costs and achieve competitiveness with fossil fuels

Strategic location of biorefinery projects in different areas promotes local and regional economic development

Integrated into a relevant industrial clusters

Next to agricultural areas with existing residues collection infrastructure

Close to clients and biotech knowledge (e.g. industries active in the bio based area, research centers, universities)

Use renewable resources more efficiently via more diverse inputs and outputs, which can be flexibly adjusted according to global market prices

Horizontal and vertical integration is being promoted through coordination mechanisms between novel crops, enzymes and processing methods, and creating new value chains

“multi input/multi output model”

2. The concept of territorial biorefinery and its genealogy

The “recognized” biorefinery

Historically the site of production “Les Sohettes” in Bazancourt-Pomacle (near Reims) gathered members of the “Industries and Agro Resources” cluster

A real network of actors based on synergies has been developed:

two farming cooperatives

two industrial units specialized in cosmetics

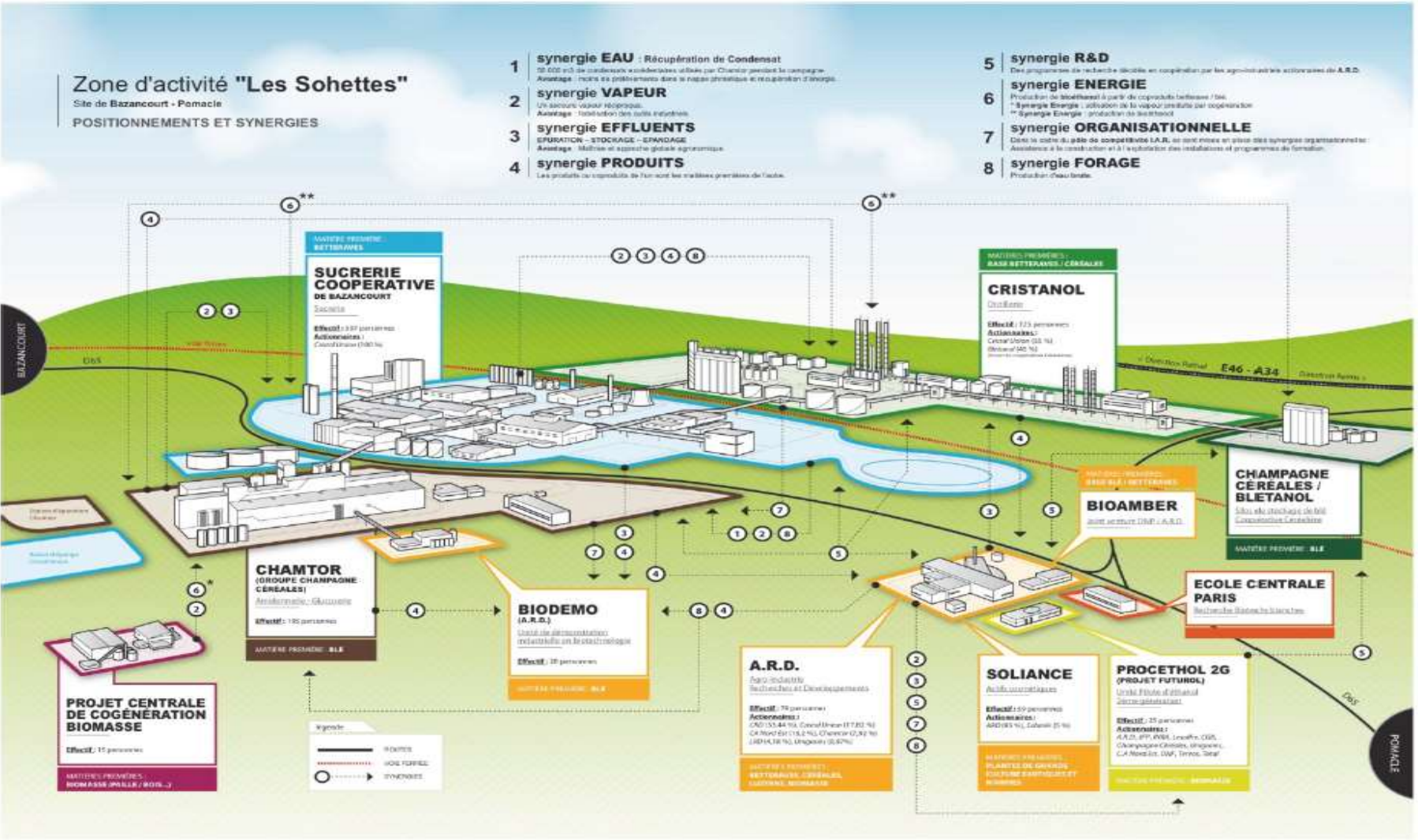
a research and development center

an industrial demonstration unit in white biotechnology

a cogeneration unit

a university laboratory specialized in white biotechnology

But this is still a biorefinery “by chance”, and not “by conception”



2. The concept of territorial biorefinery and its genealogy

The conceived biorefinery: The PIVERT project

The “ideal biorefinery”: a “fully integrated biorefinery” for which factories (belonging to one or several companies) share:

the same vegetable raw materials (valuation of the whole plant)

the energy flows resulting from different processes

the by-products (a by-product material becomes a raw material with a high value development on a neighbor site)

3. The proximity concept and its importance for territorial biorefineries

The role of proximities in the building of the territorial biorefinery

⇒ New grid of analysis and new concepts:

- *Industrial ecology principles*
- *Proximity*
- *Industrial symbiosis*
- *Socio-technological networks*
- *Organizational learning processes*
- *Multileveled interactions*

3. The proximity concept and its importance for territorial biorefineries

Definition (Kirat and Lung, 1999)

“Organizational proximity serves to connect the set of agents participating in a finalized activity within the scope of a particular activity.”

“This form of proximity relies upon a certain consistency in the configuration of relationships between agents, and is structured around a common cognitive framework. It also relies upon the representations and structures which agents use as a benchmark in order to define both their routine and strategic practices.”

3. The proximity concept and its importance for territorial biorefineries

Definition (Kirat and Lung, 1999)

“The more complex the learning processes, the more interaction-intensive they are, and the more it becomes urgent for them to be under the collective responsibility of the participants, on the basis of the layout of a common cognitive framework”

4. Consequences for agriculture

The choice of the scope and scale: the importance of soil and climatic constraints of agricultural production that lead to :

- the configuration of the supply network of the biorefinery
- the institutional and contractual architecture of the business model

A focus on the sociotechnical transition of agriculture

- development of reflexive research : conception of accompanying tools and of innovative agricultural systems
- creation of “learning niche”

The territorial biorefinery: a business model that reconsider the role of agriculture

The many facets of proximity in territorial biorefinery

New relationships, mainly based on geographical proximity

New coordination mechanisms (contracts)

New cognitive processes

Organisational proximity as a global learning process

A coordination at a territorial scale and strategic locations by different proximities (economic, industrial ecology etc.)

A diversity among companies' activities , a cluster logic

An involvement of various local public and private partners and a participatory approach toward the neighboring communities

A cooperation between agriculture, business, science and technology institutions

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