Business case ID Card

Bazancourt-Pomacle biorefinery

Name of the company: Bazancourt-Pomacle biorefinery

Country: France

Background

The history of the case began in 1948, when a few farmers decided to purchase a bankrupt distillery. This led to the creation of the cooperative sugar refinery in 1953. In 1992, regional sugar and grain cooperatives came together to establish a research society, whose goal was to find new ways of using and marketing agri-food resources. The site's destiny then changed with the simultaneous construction of Chamtor (a starch-glucose factory) and ARD (Agro-industry Research and Development), a research centre serving grain farmers and beet growers. From then on, the Bazancourt-Pomacle site became both an agro-industrial complex and an innovation centre.

The recent construction of the bio-demonstrator by ARD and the CEBB (European Center of Biotechnology and Bioeconomy) buildings opened the site to academic research and external actors. Following this, the site started welcoming researchers from prestigious institutions such as CentraleSupelec, AgroParisTech, Neoma Reims Management School and the University of Reims Champagne-Ardenne. Local and regional authorities (the Marne department, the former Champagne-Ardenne region – now Grand Est- and Reims Métropole – now Grand Reims) also helped the site to grow by providing substantial support for innovation.

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Today, the site brings together farmers, academic researchers, industrial companies, and other experts from various fields. This ensemble creates a synergetic ecosystem which allows for the full valorisation of the agro-resources transformed in the biorefinery (mainly wheat, beets and wood). This model is often cited in the field of industrial ecology. The markets concerned cover the agricultural sector as well as the chemical, pharmaceutical, cosmetics and bioenergy sectors. Today, the site transforms more than 4 million tons of biomass annually and is still aspiring to expand, with several hundred hectares available for new facilities; either laboratories, pilot or industrial units.

Main activities

Bazancourt-Pomacle brings together farmers, academic researchers, industrial companies, and other experts with the common goal of optimising the use and valorisation of biomass. This dynamic ecosystem only functions thanks to the production of biomass by the farmers of the region. Wheat, beet and now wood are the main vegetable products processed by the site. On one side of the site, Cristal Union produces sugar with the beets, while on the other side of the site, Chamtor – now ADM Bazancourt- transforms the wheat into food products and other products like glues and various products for technical applications. The by-products from both facilities are sent to Cristanol owned By Cristal Union, who turns them into ethanol and alcohols. The bio-CO_2 emitted during the process is captured and sent to Air Liquide, who compresses it for use in the production of soft drinks.

Alongside the industrial activities,ARD is offering various demonstration equipment able to scale up biotechnology projects from lab scale up to industrial scale and produce first commercial runs. ARD acquired the pilote activity o of the ex-Futurol Project to enable its commercial development and open the platform to develop products. Futurol is asecond-generation bioethanol process based on specific - usually unused - parts of plants (stems and leaves). ARD has launched WHEATOLEO producer and seller and newly bio based surfactants. GIVAUDAN Active Beauty is a committed actor on the biorefinery platform with its White Biotechnology Centre of Excellence based in Pomacle.
Using biofermentation to produce new innovative cosmetics ingredients based on local sourcing enables to decrease significantly the impact on the environment. Indeed the techniques used in this circular economy allow to mitigate the shortage in the supply of raw materials and to avoid endangering Nature.
Givaudan leverages from different synergies they have with some other key players of this industrial metabolism generated by the biorefinery platform - enabling them to save water and to reduce CO2 emissions - to get a full traceability and to produce from renewable plant bio-based products.
What makes it a perfect ecosystem is that all the biological waste is recycled, as all leftovers and by-products are upgraded or spread on land. Lately, Européenne de Biomasse has constructed a plant to produce HPCI Black pellets out of wood, with the support of two investors: Banque des Territoires and Meridiam. This new product will be sold to replace coal granules used in traditional boilers by biobased substitute.

New projects constantly arise to optimise the site's functioning. For example, nearby,the experimental Farm 112 develops new multi-year agricultural systems

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based on new technologies (digital, machinery) for assessing new production and harvest systems. The objective is on one hand to improve the sustainability and performance of agricultural production and on the other hand to create a business park, welcoming new companies active in the bioeconomy sector. These innovative projects are led by the innovation platform BRI (Research & Innovation Biorefinery), covering a wide range of research and development activities, from laboratory research stage to industrial demonstration. The BRI includes private employees from the ARD and a public research team from the CEBB.

This dynamic multi-enterprise ecosystem annually transforms approximately 1 Mt of wheat,3 Mt of beet and 0,5 Mt of wood into products for the food industry - a priority - but also the chemical, cosmetics and pharmaceutical industries, the packaging industry, fuels and more. The site's configuration makes it one of the showcases of the national competitiveness cluster "Industries & Agroresources". This biorefinery has also been recognised as one of the main chemical platforms in France.

Market

In 2018, the site's total revenue reached approx €800 million, mostly from the companies working at the site. Their markets cover the agriculture sector as well as the chemicals, cosmetics and bioenergy sectors. Communication efforts are currently being developed to promote the site at national and international level.

The biggest "competitor" of the site is Roquette – an agri-food multinational - but the Bazancourt-Pomacle biorefinery differs from Roquette for various reasons. First of all, Roquette is a business while the Bazancourt-Pomacle biorefinery is more than just an industrial zone: it is also an innovation cluster. . Additionally, the biorefinery was built on the initiative of a sugarbeet cooperative – called today Cristal-Union - , with the founding farmers sacrificing a year of their revenues to invest in the project. This explains the strong territorial anchoring of the biorefinery.

The development of the Bazancourt-Pomacle biorefinery was fuelled by the growing interest in the "new bioeconomy" (Bio-Based Economy), which is considered a priority in the French 2020 strategy. This explains why so many actors have financially supported Bazancourt-Pomacle. The site allows the multiple enterprises located on it to contribute to the development of the bioeconomy in the most sustainable and participative way possible. Today more than 1,200 direct jobs have been created on the site, plus around 1,000 indirect jobs in the surrounding area. 20% of the total costs go into salaries.

Challenges and solutions

One of the main challenges for the site is the attraction of new projects because settling on the site is not plug and play for the time being. Indeed, the new actors do not necessarily know who to turn to, and do not necessarily find land. The biorefinery players are getting organised to with a common governance to create a

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formal collaboration within the territory, with the intention define a common vision, to organise new infrastructure (including road access for 4Mt of raw materials, water connections etc) and to attract new businesses involved in bioeconomy.

A major concern for the future is that there is no coherence and no roadmap on environmental and social aspects. Nevertheless, all actors have common objectives and common topics of interest such as road traffic management, water management, and the control of atmospheric impacts. This is expected to strengthen the cooperation of the various actors on these environmental and social issues.

Funding

The Cristal Union cooperative group was the initiator of the biorefinery, and invested €272 million in the construction of a beet and wheat base distillery in 2006. An additional amount of €30 million was invested in a biomass boiler, with a financial help of ADEME (the French Agency for the energy transition).

The key partners helping financially the development of the site - mainly the innovation platform - are the (former) Champagne-Ardenne region and 'département', the French ministry, the Caisse des Dépôts, the European Union and all institutional, technical, and research stakeholders gravitating around the site. The site's total revenues today are sufficient but additional funding and financial support from various actors is essential to support innovation in the research and development structures to finance the pilot projects, the bio-demonstrator and the academic campus, to up-grade the facilities and build a plug and pay offer to attract future bioeconomy projects.

What makes this case innovative?

The added value of the site comes from its territorial anchorage and its involvement in industrial ecology. The cooperation between its various actors makes the Bazancourt-Pomacle biorefinery a leading industrial site at the same time as a leading innovation hub in the bioeconomy. In addition, even if academic actors from prestigious schools are now working on site, interactions with the local population remain central to the biorefinery's ethic. This local and regional anchorage is the result of the common will of all actors to develop sustainable solutions to environmental and social issues linked to the site.

In this unique cooperative model, industries complement each other while innovation platforms provide the companies with new, more efficient, sustainable and profitable technologies. Thanks to this complementarity of industries, very little waste is produced on the site, as all by-products go into upgrading or land spreading. Only some packaging wastes, cans, etc. are considered as waste. Similarly, water is exchanged and recycled between the different companies, which allows a reduction in consumption. For instance, the company ADM-

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Bazancourt valorises one of its fermentable co-products in the distillery (instead of sending it 500 km away). Additionally, all the actors of the site are certified ISO 14 000 for environmental management.

This unique cooperation is what attracts new businesses and is expected to keep the site successful.

Lessons learnt

The most important factor was the strong dedication from all local authorities (the Marne department, then the Champagne-Ardenne region and finally Reims Métropole) to develop the site. This local anchorage was important and so was the willingness of all companies to work together. The interaction between all the actors is crucial for the creation of an ecosystem of industrial and territorial ecology. The various economic actors must be open and ready to cooperate. Technical cooperation and complementarity on-site must be discussed. Actors also have to be ready to invest to build and develop a successful common project like this one.

The development of such cooperative business models in the bioeconomy all around Europe is a solution to develop very strong added value to agriculture by exploiting the best use of each residue.

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