



## REPORT SmartPilots STUDY VISIT 2: ARD September 14<sup>th</sup>, 2016

### Short description of the shared pilot facility that was visited: brief history, how is the organization financed, business model, # of employees

ARD has been established in 1989 as a company (Société Anonyme) by two farmer cooperatives, Champagne Céréales and Cristal Union. The task was to find new substantial outlet outside of conventional food to cereals and sugar produced in the Région Champagne Ardenne, to valorize large volume of cereals and sugar. In 1992, all the cereal cooperatives of the area joined the initiative and became shareholder through a union of cooperatives, so called CRD (Cereal Research and Development).

Since the beginning, ARD did develop three main expertises, plant fractionation, white Biotechnology (one of the first project was to produce Bioethanol), and Green Chemistry. In order to increase the research resources, the cooperatives asked the company to find financing resources through public funding and by value creation on niche markets. In this respect, ARD did participate in some collaborative Research Project financed by European Commission, French ADEME, and Région Champagne Ardenne, and did establish a subsidiary, SOLIANCE for the development of a cosmetic ingredient business following a R&D program with L'OREAL.

SOLIANCE was launched in 1994 after L'OREAL did commit to purchase part of the production of a biotechnology factory producing Hyaluronic acid and dihydroxyacetone. The company has been developed through a product diversification (polysaccharides, plant extract...) coming from ARD Research programs, and a commercial presence in Europe, USA and Asia. SOLIANCE has been sold to GIVAUDAN Group in 2014 to allow the company to have enough financial and marketing resources to secure its growth.

In parallel, ARD has been designing a process to extract gluten from wheat and to produce starch and glucose, this came up in 1992 with the creation of CHAMTOR company who is processing 450 000t/year of wheat coming from local farms, and a process to produce Ethanol out of wheat, which allow the establishment of Cristanol and the construction of an Ethanol production factory in 2007-2008 processing 500 000t of wheat and 1 200 000 t of beet per year. These two results allowed ARD to reach the original target.

ARD has been one of the founding partner of the competitiveness Cluster IAR (Industries et Agro Ressources), in 2005, and has been labeled as "OPEN INNOVATION PLATFORM" by the French Ministry of Industry in 2009, by bringing on the same site, Academic Research Centers, an organization for Dissemination and Lobbying, and building an Industrial Demonstration Plant for Industrial Biotechnology. This plant includes a 180 m<sup>3</sup> volume fermentor, together with a comprehensive set of Down Stream Processing. The plant has been used to scale up of various process for Industrial Groups and start up.

**Business Model:**

ARD is a TRL (Technology Readiness Level) enhancer, in the frame of Biorefinery, white Biotechnology, and Green Chemistry.

The company has four activities: Process Development in Plant Fractionation (extraction and purification of Plant Extracts), White Biotechnology (Fermentation and DSP), Plant Based Chemistry (esterification, polycondensation, chemical synthesis), Environment (Methanogen Power determination, ...),

The company provides services for:

- Scaling up from laboratory scale to pilot scale: 150l, 1500l fermenters and associated DSP, 300l, 1000l Chemical Reactors,
- Scale up to Industrial Demonstration size, 10 and 180m<sup>3</sup> fermenters with associated DSP, 350m<sup>3</sup> Bioconversion Tank, 4 and 9m<sup>3</sup> glass lined Chemical Reactors, Thin Film Evaporator, distillation column,
- Tolling: Production of various cosmetic actives, food ingredients, chemical intermediate, fragrances ...

The Total yearly revenue is around 10 Million€, including:

- Contracts with Shareholders,
- Subsidies linked to Consortia Research Programs,
- Research Tax Credit,
- Bilateral Contracts under Non-Disclosure Agreements,

Total yearly expenses are in the range of 10 Million€, including:

- Wages,
- Depreciation of Assets,
- Others,

In addition, ARD has launched some business coming from R&D contracts Research with its shareholders, such as: SOLIANCE (Cosmetic Actives sold to GIVAUDAN GROUP in 2014) and WHEATOLEO (BioBased Surfactants).

## Meeting Agenda

**9 :00**      **Arrival and Coffee**

**9:30- 10:00**      **Welcome and Introduction to the SmartPilots Project:** Ambition, Approach, Consortium  
By Mr Brecht Vanlerberghe, R&D Manager, Bio Base Europe Pilot Plant

**10:00 – 11:00**      **Partner Presentations:**

- 10:00 – 10:10      Bio Base Europe Pilot Plant
- 10:10 – 10:20      Centre for Process Innovation
- 10:20 – 10:30      VTT Technical Research Centre of Finland Ltd.
- 10:30 – 10:40      Bioprocess Pilot Facility
- 10:40 – 10:50      Innovhub SSI
- 10:50 – 11:00      Fraunhofer CBP

**11:00 – 12:00**      **ARD PRESENTATION:**

By Mr Yon Le Hénaff, General Manager

- History
- Current Business Model
- Organisational structure
- Direct and indirect support Mechanisms
- Network
- Generated Impact

**12:00 – 12:30**      **Questions and Answers**

<b>12:30 – 13:30</b>	<b>Lunch</b>
<b>13:30 – 14:30</b>	<b>Guided visit to the Laboratories, the Pilot and Demonstration Plants</b> (Green Chemistry and White Biotechnology)
<b>14:30 – 15:00</b>	<b>Introduction to the French cluster for Bioeconomy (IAR)</b> By Mr. Thierry Stadler, President
<b>15:00 – 15:30</b>	<b>Current Regional Direct and Indirect Support for Innovation</b> By Mrs Agathe Oliviera, Grand Est Region
<b>15:30 – 16:00</b>	<b>Current Direct and Indirect Support from the French state for Innovation</b> By Mrs Stéphanie Hugon, in charge of Plant Based Chemistry projects at DGE (French Ministry of Industry)
<b>16:30 – 16:30</b>	<b>Questions and Answers</b>
<b>16:30</b>	<b>End of the SmartPilots Study Visit 2</b>

<h2>Highlights of the discussion</h2> <p>During discussions, the following points were highlighted: a positive system in France for Research (Research Tax Credit), and two negative experiences in the financing of Demonstration steps of projects.</p> <ul style="list-style-type: none"> <li>- The <b>French Tax Credit for Research</b>, this system is very positive, as it allows companies registered in France, to take benefit of a tax credit amounting to 30% of the money spent on R&amp;D activities, including amount of invoices charged by companies labelled by the French Ministry of Research. This system is a real Tax Credit, ie companies not doing any profit get payment from French Treasury of the 30% of eligible amount,</li> <li>- <b>EFRD Financing rules:</b> ARD which is not a “Non for Profit Organization”, did invest in an Industrial Demonstration Plant to allow the scaling up of White Biotech processes in 2009. The Total CAPEX was 22 Million€, the project has been financed through an equity increase of the company, a bank loan and subsidies coming from Region Champagne Ardenne, Département de la Marne, for 1.25 Million€ each and EFRD for 2.5 Million€. The Project has been audited by EFRD, and the conclusion was that European Funds were not able to take into account the Depreciation of the CAPEX, together with the Financial Costs of the Loan in the Eligible Cost, therefore, they decreased the Eligible Cost of the Project, and ARD was to reimburse 1.05 Millions€ to French Treasury. <b>This points out certain difficulties for Demonstration activities in Europe</b>, as on the same time, USDA and USDOE did grant Demonstration Projects in White Biotechnology for 50% of the Total cost. In this respect, it happens that Bioeconomy R&amp;D results from Europe are further demonstrated and developed outside, in North America, Brasil or Malaysia.</li> <li>- More recently, a European SME liked to take Benefit of <b>SME Instrument</b> for the financing of a demonstration step for the development of a process to produce a chemical intermediate by white Biotechnology. The company did submit a file and did not get any financing, as the project cost was including the usage of an existing Demonstration Plant which is not eligible.</li> </ul>
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## Annex 1: Participants List

Name	First Name	Job Title	Affiliation	Project Partner	Case Study	Stakeholder
Aubry	Philippe		ARD, FR		1	
Boccasile	Gabriele	Project Manager	Agriculture Dept. of Regional Government, Lombardy, IT			1
Bonetti	Ilaria	Project Manager	ISSI, IT	1		
Chauvet	Jean-Marie		ARD, FR		1	
Concile	Cécile	Conseiller adjoint aux Investissements	Belgian Embassy - Flemish delegation, BE			1
Creten	Tom	Beleidsmedewerker / Policy Officer	Dep. Economy, Science, Innovation, Flanders (EWI)	1		
Donati	Roberta	Project Manager for Environment Area	Metropolitan City, Prov. of Milano, IT			1
Duval	Jean-Christophe		ARD, FR		1	
Flippo	Peter	Business Development Manager	Bio Process Facility, NL	1		
Härkönen	Mika	Managing Director	VTT, FI	1		
Hugon	Stéphanie	In charge of Plant based Chemistry projects	DGE (French Ministry of Industry), FR			1
Huisman-Zilverentant	Carolien	Advisor Biobased Economy for SPF project / Program Manager	Biobased Delta, Zuid-Holland, NL			1
Krieg	Sabine	Business Development	Fraunhofer CBP, DE		1	
Le Hénaff	Yvon	CEO	ARD, FR		1	
Lincoln	Derek	Project Manager	Centre for Process Innovation (CPI), UK	1		
Lopinto	Paolo	Manager Assistant	ISSI, IT	1		
Molders	Katrien	Communication Manager	Bio Base Europe Pilot Plant (BBEPP), BE	1		
Mouy	Jennifer	DIRECCTE	DIRECCTE Alsace Champagne Ardenne Lorraine, FR			1
Oliviera	Agathe	Chargée de mission innovation, Direction de l'Enseignement Supérieur, Recherche et Innovation	Région Alsace Champagne-Ardenne Lorraine, FR			1
Pearson	Steven	Head of Business & Strategy	Centre for Process Innovation (CPI), UK	1		
Sederel	Willem	Chairman and Board member	Biorenewables Business Platform / Biobased Delta, NL			1
Stadler	Thierry	President	IAR, FR			1
Tukiainen	Pauliina		VTT, FI	1		
Vanlerberghe	Brecht	R&D Manager	Bio Base Europe Pilot Plant (BBEPP), BE	1		
Zanetti	Laura	Resp. for energy production, energy saving and air quality plan	Metropolitan City, Prov. of Milano, IT			1
<b>Total</b>	<b>25</b>			<b>10</b>	<b>5</b>	<b>10</b>

**Annex 2: Pictures of the study visit**

