# The Biorefinery Bazancourt-Pomacle Reims, France:

## a strong commitment of farmers for years

## Make bioeconomy happen through innovation

ard
INNOVATION IN GREEN

European Bioeconomy Alliance

10 March 2015

# ARD is an opened Research & Development Centre


## Who we are

- ARD is an opened R&D center in the field of crops fractionation, white biotechnology and bio-based chemistry

## What we do

- We develop innovative processes to produce, food ingredients, chemicals derived from biomass or food industries by-products

## What we stand for

- We add value to agricultural products via R&D and we introduce new outlets for the agricultural economy.
- We develop innovative and competitive products and processes that are sustainable and ecologically sound alternatives to petrochemicals.
- We focus on bio-refinery concepts that are designed to process all plant fractions to valuable products.
- We capitalize on synergies among various crops for discovery of innovative molecules.
- We actively promote utilization of bio-based resources in industrial applications and more generally in the economy and the society.

**ARD is mainly Owned by** VIVESCIA Industries CRISTAL UNION

**Member of the cluster** IAR COMPETITIVENESS CLUSTER INDUSTRIES & AGRO-RESSOURCES EuropaBio & Bio-based Industries Consortium

ard INNOVATION IN GREEN

# ARD is Integrated Into an Existing Biorefinery (close to Reims France)

ARD - Mutualised research center(1992)
Wheatoleo - Green Surfactants (2010)

**Chamtor**
Wheat refiner
(1992)

**Cristal Union**
Sugar beet refiner
(1953)

**Cristanol**
Ethanol plant
(2007 - 2009)

**Air Liquide**
(2010)

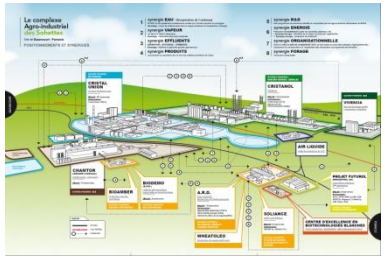
**BioAmber**
(2005)


**Procéthol 2G – Projet FUTUROL**
Lignocellulosic ethanol pilot
(2011)

**Soliance**
Cosmetic Ingredients (1994)

**Centre d'Excellence en Biotechnologies Blanches**
Academic research in Industrial Biotechnology
(2011 – 2012)

integration & synergies



# A site combining industry / research /training – food & non food products

Food and feed industry

Biofuels and feed

Specialty chemicals

Fine chemicals

Private research with its demo unit

Industrial pilot

Start-ups hosted

Academic research and training

Think tank foundation of enterprise

ard

INNOVATION IN GREEN

# Fields of expertises

# ARD is working on biorefinery management

| | Plant fractionation | Industrial Biotechnology | Green Chemistry | Environment |
|---|---|---|---|---|
| **Our Knowledges** | ❑ Mechanical, thermal, chemical or enzymatic processes<br>❑ Chemical or enzymatic depolymerization<br>❑ Purification by liquid/solid separation (decantors, centrifuge, filters, cross flow membrane)<br>❑ Ion exchange, absorption, chromatography, | ❑ Screening of microorganisms<br>❑ Batch, fed batch continous fermentation process<br>❑ Aerobic, anaerobic fermentation, metabolite extraction<br>❑ Purification | ❑ Organic chemistry : chemistry of plant origin components (carbonhydrates), catalysis, polymers chemistry<br>❑ Physicochemistry and formulation in detergent, cosmetic, agrochemistry | ❑ Olfactory pollution analysis<br>❑ Waste treatment (methanisation)<br>❑ Biodégradability tests<br>❑ Ecotoxicity tests<br>❑ Lice Cycle Assessment |
| **Our Products** | ❑ Extraction of pentoses out of wheat bran<br>❑ Food protoypes<br>❑ Rare sugars<br>❑ 1st generation ethanol<br>❑ Lignocellulosic ethanol<br>❑ Alfalfa proteins | ❑ Biopolymers<br>❑ 1st generation ethanol<br>❑ Succinic acid<br>❑ Other chemical intermediates<br>❑ Food grade strains production<br>❑ Fermented food products | ❑ Polyesters and agromaterials<br>❑ Green surfactants<br>❑ Specialty chemicals for cosmetic, detergent, civil work, agroindustry, aeronautic, plasturgy… | **Analytics**<br>❑ HPLC-HPLiC<br>  ❑ Sugars analysis<br>  ❑ Ions analysis<br>❑ Bacteriological analysis<br>❑ Ashes, Nitrogen, Fibers,OD… |

# Demonstration unit BioDémo


With the financial support from

# Example of Projects developed through ARD

| Company | R&D stage | Pre industrial stage | Industrial and commercial stage | Type of products |
|---|---|---|---|---|
| Chamtor, 1992 | | | | Glucose Starch and Gluten |
| Soliance, 1994 | | | | Cosmetic ingredients (Hyaluronic acid, DHA, Sophoro-lipids…) |
| BioAmber, 2005 | | | | Succinic acid |
| Cristanol, 2007 | | | | Ethanol, DDGS and CO2 from wheat |
| Procéthol 2G, 2008 | | | | Ligno-cellulosic ethanol, |
| WheatOleo, 2009 | | | | Biosurfactants (Alkyl Poly Pentosides) |
| Amyris, 2013 | | | | *Under NDA* |
| Global Bioenergies | | | | Isobutene |

# FUTUROL: A French consortium on Cellulosic Ethanol

Projet FUTUROL PROCETHOL 2G


- Project between all stakeholders of the biofuel value chain
- Development of a cellulosic Bioethanol technology
- Develop a technology which can use all kind of biomass (waste, straw, wood, non-food crops, etc…)
- ARD expertise used in fractionation and fermentation
- Total budget 76.4 M € - Total public funding : 29.9 M €
- Pilot plant operational in Pomacle in 2011
- Demonstration plant expected in 2014
- Full scale industrial plant expected around 2016

oséo

**Thank you for your attention**

**www.a-r-d.fr**