



**PCAS, THROUGH ITS SUBSIDIARY PROTEUS, IS CONTRIBUTING TO THE CONVERSION OF WOOD FURNITURE WASTE**  
**Identifying new ways of converting furniture wood waste**

Longjumeau (France), December 2, 2014

**The specialty and fine chemicals group PCAS is proud to announce its participation, through its subsidiary Protéus, a biotechnology company specialized in the production of enzymes and microbial strains for industrial applications, at the heart of the Vadébio\* project.**

*\* "Valorisation des déchets d'éléments d'ameublement en molécules d'intérêt par traitement biologique" (conversion of furniture waste to molecules of interest by biological treatment)*

Since May 2013, the eco-organization Eco-Mobilier has deployed sectors in France to recover and manage furniture from private individuals for recycling, thus contributing to saving resources. Predominantly made of wood, this furniture cannot be converted in current recycling networks mainly made up of particle board production channels.

In light of this observation, Eco-Mobilier, in association with the ADEME and Valdelia launched a call for proposals in order to identify new solutions to convert this waste.

Vadébio is a collaborative Research & Development project which will be led from January 1 by a consortium of partners, namely Séché Environnement (coordinator), Valagro, Eco-éthanol and Protéus, in order to develop conversion techniques for furniture waste (DEA: Déchets d'Eléments d'Ameublement) into molecules of interest that can be mobilized through fermentation.

**Developing new techniques for managing undesirable substances contained in wood**

Undesirable substances such as glue and varnish are often present in furniture wood which can impact the recycling process.

In relation to ethanol production, they can also inhibit enzymatic hydrolysis and fermentation. Vadébio will enable identification of the means of rendering the process resistant to inhibitors, either by integrating a preliminary wood-decontamination stage or by developing cellulases that are resistant to pollutants.

The wood thus treated can then be mobilized to produce molecules of interest.

**Producing molecules of interest for 2<sup>nd</sup> generation bio-refineries**

The wood cleared of inhibitors will enable the production of fermentable sugar liquids which after fermentation can be used, for example, to produce bio-ethanol. This potential, which can be mobilized on a local scale, may be used as a complementary resource by bio-refineries in a circular economy approach.

The project is one of the three retained by the ADEME and the eco-organizations Eco-Mobilier and Valdélia out of the sixteen that were in competition. It is aimed at recycling and converting furniture waste through a combination of physico-chemical treatment and a biological conversion stage, in particular through the production of molecules of interest.

A particularly innovative project, it will enable the clean development of the exploitable parts of the ligno-cellulosic fractions of this waste (wood makes up approximately 60% of the tonnage of unsorted furniture waste), parts of which cannot be recycled into particle board.

This potential constitutes a complementary resource for bio-refineries that can be mobilized on a local scale and a territorial development factor in the context of a circular economy.

The interest of this research program is to develop processes to enable the conversion of wood fractions, in the form of fermentable molecules of interest to be used in the creation of bio-ethanol and/or other value-added compounds, despite the presence of varnish or other glues, which are as much undesirable substances as they are susceptible to impact, even render inefficient, the conversion process.

**With the Vadébio project, Protéus, the industrial biotechnology subsidiary of the PCAS Group, confirms its positioning in a circular economy by bringing all its expertise and know-how to the project.**

#### **About the consortium:**

Séché Environnement is a French company (SA with a capital of €1,607,692) created by Joël Séché in 1985, its headquarters are located in Changé, a municipality of Mayenne. SÉCHÉ ENVIRONNEMENT has recognized know-how (all sites are certified) in the domain of treatment, elimination, recycling and conversion of waste, whatever its nature (domestic and industrial), form (solid, liquid or gas) or hazard level, except radioactive waste, and also in the domain of extracting new resources from waste (matter and energy). Present over the whole French territory with around twenty subsidiaries, the Group has 1,800 employees with a turnover of €469 million on December 31, 2013.

Protéus is a cutting-edge biotechnology company created in 1998. It is specialized in the discovery, engineering and production of proteins of industrial interest, as well as the development of innovative bio-procedures using these proteins. The efficacy of Protéus' proprietary technology has been demonstrated by the numerous developments in all life-science industries and in particular health care sectors, fine and specialty chemicals, the environment and bio-engineering.

Valagro Carbone Renouvelable is a technological platform specialized in the industrial conversion of biomass, its co-products and waste. VALAGRO's main aim is to guide clients and industrial partners in the development and implementation of innovative procedures based on plant and recycled carbon chemistry. The domains of application are essentially in energy (bio-fuels), materials and bio-polymers as well as specialty products from green chemistry.

Eco-Ethanol, created in September 2009, is a subsidiary wholly owned by SEM VALAGRO. The company has developed a continuous process of biochemical conversion of lignocellulose which enables the acquisition of sugars with five or six carbon atoms, platform molecules used for the synthesis of numerous chemical compounds obtained from plants (lactic acid, xylitol, xanthan, surfactants etc.) or for the production of second generation bio-fuels (ethanol). The process also produces high-quality lignin and aromatic compounds offering numerous conversion solutions such as the production of specialty industrial polymers.