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White Biotech or Industrial Biotech?

An Overview of Major Projects in Europe

By Dr Holger Bengs and Ulrike Gerecke, BCNP Consultants GmbH*

It appears as if the terms white and industrial biotechnology are being differentiated in order to pay attention to the size of the business concerned. Whether this differentiation is useful or not, is open for discussion. What can be said, however, is that small and medium-sized companies put emphasis on achieving greater added value on the basis of enzymes, chemical products and on specialized research approaches in the area of systems biology – instead of just looking at quantities. An overview of major projects in Europe.

High-Quality vs. Mass Production

A high proportion of the small and medium-sized white biotech companies are developing products for the pharmaceutical, the cosmetics and the food



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FIG. 1: BIOREFINERIES IN WESTERN UND NORTHERN EUROPE



blue: number of biorefineries, yellow: refinery-related R&D pilots and demonstrations
Source: BIOPOL & Biorefinery Euroview Report, 2009, BCNP Consultants GmbH,
map: EasyMap 9.2

market (see also GoingPublic special supplement White Biotechnology 2010). Although some successes have been achieved and high-value end products – mainly specialty chemicals – have been developed, the industry lacks visibility and assertiveness. This might be a reason for venture capitalists not having appeared in the white biotechnology yet. More money and funds go to biomass utilization and its wide range of marketable products, in particular biorefineries. A bioethanol plant in Hull, England, with an annual output of 420 million liters and the prospect of overcoming humanity's shortage of energy and raw material is maybe more inspiring – at least for political decision makers – than a 20 cubic meters fermenter for the production of additives of all kind.

Europe's Biorefineries

Most things happen in Western and Northern Europe with 36 refinery locations and 43 existing or planned refinery-related R&D pilots and demonstrations in 2009 (see map). When looking at the number of pilot plants, the Dutch seem to be the most ambitious

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researchers. In terms of locations, Germany is in third place, but with the construction of the biorefinery plant in Straubing to produce biofuels from Lignocellulose, it equals France in second place, just behind Belgium. The project is supported by the Bavarian state government and the Federal Ministry of Education and Research with EUR 5 million each. In advance, EUR 12 million were invested in research.

Total Funding of the European Union

To set the course for global competition, the Biomass Action Plan adopted by the EU Commission in 2005 formulated four objectives: increasing biomass demand, improving supply, overcoming technological obstacles and intensifying research.

As a consequence, the Framework Program for Research and Technological Development has been upgraded as the EU Commission's central instrument for relocating development funds. In comparison to



The Biomass Action Plan adopted by the EU Commission in 2005 formulated four objectives. One of them is to increase biomass demand. Source: CRES

the previous Framework Program 6 with a volume of EUR 17.5 billion for the years 2002 to 2006, the total budget for Framework Program 7 has been increased to EUR 50 billion for the years 2007 to 2013. Funding for the industrial biotechnology mainly takes place in the area of biorefineries and biomass

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utilization. The projects focus on improving the network of existing initiatives and the collaborations to find new ways to utilize biomass more efficiently – from harvest to end product. As a

comparison: Since the implementation of the Recovery Act in June 2009, the US-American Department of Energy (DOE) will fund biomass and biofuel projects with USD 13.7 billion until 2016 in order to replace one fourth of today's consumption of fossil fuels by 2025.

BIOPOL – Funding With a Huge Impact

One of the programs included in the Framework Program 6, BIOPOL, was funded for two years with EUR 0.55 million to assess the quality of innovative bio-refinery concepts. The differentiation of the three biomass types crops, green biomass (grass, clover, algae)



Group picture of all of the members of EuroBioRef.

TABLE 1: SISTER PROGRAMS FOR THE NETWORKING OF INDUSTRIAL BIOTECH PROJECTS FROM FRAMEWORK PROGRAM 7 OF THE EU COMMISSION (R&D = RESEARCH FACILITIES)

NAME OF PROJECT	START	BUDGET (EUR MILLION)	RUNTIME (MONTHS)	PARTNERS (COUNTRIES)
BIOCORE	MAR 10	13.92	48	24 – 14 INDUSTRY, 10 R&D (13)
EUROBIOREF	MAR 10	23.07	48	28 – 19 INDUSTRY, 9 R&D (14)
STAR-COLIBRI	NOV 09	1.95	24	11 – 11 R&D (6)
SUPRA-BIO	FEB 10	12.60	48	17 – 9 INDUSTRY, 8 R&D (7)

Source: BCNP Consultants GmbH

and lignocelluloses helped to specifically strengthen the expansion of individual methods of refinery. Exemplary, we like to mention Roquette's Biohub Program utilizing crop plants: This co-operation of French and other European companies with public laboratories focuses on the development of new markets for the production of chemicals based on renewable agricultural resources. Today, the French Industrial Innovation Agency supports nine major industrial projects with a total sum of EUR 590 million. Due to the success of BIOPOL, its follow-up project Star-COLIBRI is now funded with nearly EUR 2 million (See table 1).

EuroBioRef – Network With Educational Components

For the next four years, the EuroBioRef Project, coordinated by the French Centre National de la Recherche Scientifique (CNRS), has secured its financing of EUR 23 million from the Framework Program 7. EuroBioRef supports projects along the value chain field, transformation process and products. The consortium behind EuroBioRef consists to two thirds of companies and to one third of research facilities. Sustainability is crucial for EuroBioRef, not only with regard to processes: After having organized first lectures on biorefinery and a summer school this year, the University of Lille is thinking about a suitable master program. Biorefinery is not a one-off topic, but an important trend.

Summary:

Europe is moving forward, at the beginning due to research promotion: Expenses are steadily increas-

ing, the formation of consortia and European networks is supported everywhere. By developing educational components, the next generation is already being integrated today. Not only small and medium-sized companies, but also great players follow the trend. Just think about the big airlines: More than just a few co-operate with biofuel deliverers, e.g. Lufthansa and Finnish Neste Oil. In Germany, not only the cluster initiative Industrial Biotechnology, but also the Strategy Bio-Economy 2030 of the federal government follows the trend. With a funding of EUR 2.4 billion, the vision of a sustainable bio-based economy is to be realized: sufficient nutrition and high value products, not only in Germany, but worldwide. The distinction between white and industrial is nothing but semantics. Biotechnology will enter our everyday lives, and it will remain a force for prosperity. For the small and medium-sized companies, we hope that they will be able to approach the big subsidy funds and not be outperformed by the giants of the industry.

EUROPEAN FORUM FOR INDUSTRIAL BIOTECHNOLOGY (EFIB)

The European Forum for Industrial Biotechnology (EFIB), which has been taking place once a year since 2008, could become the leading trade fair in Europe. 325 participants from 28 countries met from October 19 to 21, 2010 in Edinburgh: Large-scale industry like Henkel, GE, Dupont, Cargill, DSM, Genencor and Süd-Chemie as well as start-up and medium-sized companies, cluster manager and scientists from all over Europe took part. An exhibition and the partnering provided great opportunities for dialogue and exchange. It was amazing, however, that Germany, compared to its size, was underrepresented with only 10 percent of the participants. The next EFIB for further networking and collaboration building will take place in Amsterdam from October 18 to 20, 2011.

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