



The European Association for Bioindustries

Press Release

White Biotechnology (bioprocesses): a gateway to a more sustainable future, studies say

Lyon, 10 April 2003: Six studies presented today by Feike Sijbesma, Chairman of EuropaBio¹ and member of the Board of DSM² show that the use of micro-organisms like moulds, yeasts or bacteria and enzymes in industrial production can contribute to sustainability by saving on the use of water, energy and raw materials. Using bioprocesses, known as White Biotechnology³, to produce antibiotics, vitamins, detergents, bio-plastics and new textile fibres decreases the environmental footprint while in a number of cases also creates economic value and at the same time also new jobs. "Today we show that White Biotechnology can contribute to all aspects of Tripe P - People, Planet, Profit," says Feike Sijbesma.

A group of innovative companies submitted six different bioprocesses to the environmental scrutiny of independent peer reviewers⁴, among them the Oeko-Institute from Freiburg, a scientific institute with a high reputation among environmentalists. All studies showed important environmental benefits, be it in reducing water or energy use or CO₂, with five case studies also scoring high on economic value. "We are encouraged by the positive results of our case studies, which confirm the OECD⁵ results on the benefits of biological processes," says Steen Riisgaard, Chair of EuropaBio's Industrial Biotechnology Board and CEO of Novozymes⁶. "In the next step, we have to find new ways to broaden the range of biological processes." Today biological processes are a reality in producing, for example, certain fine chemicals, antibiotics or detergents. In the future the technology should advance to be used in many other industrial processes too.

"To capture the potential of White Biotechnology a Technology Platform (with all stakeholders present) should be set up," says Feike Sijbesma. "We need to develop a vision and roadmap, we need to work on financial incentives, a supportive regulatory framework and reduce biological feed stock prices".

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The promise of a new biobased economy has spurred the US to develop a long term strategy and a technology road map to 2020. According to Feike Sijbesma, “Such a change cannot happen overnight in Europe, but the EU must start to make long term plans right now”.

Copy of the slide presentation and photo materials can be downloaded from the following web page

http://www.europabio.org/pages/ne_wb_100403.asp

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Results of the Independent review

The following companies: BASF, DSM, Novozymes, CargillDow, DuPont and Genencor⁷ have asked independent organisations to carry out environmental assessments of 6 case studies, comparing White Biotechnology processes to traditional processes.

1. **BASF⁸ - Vitamin B 2** (assessment by the Oeko-Institute)

White Biotechnology reduces the traditional 6 step chemical process to a 1 step biological process and lowers costs by 40 %.

2. **DSM - Cephalexin (an antibiotic)** (assessment by the Oeko-Institute)

White Biotechnology reduces energy and materials use by 65% each and variable costs by 50% compared to traditional processes.

3. **Novozymes - Textiles (scouring)** (assessment by the Oeko-Institute)

White Biotechnology replaces the hot alkaline solution with an enzyme to do the scouring job, and in so doing reduces emissions to water by 60%, energy use by 25% and the bioprocess is 20% cheaper than traditional scouring techniques.

New biobased polymers

4. **Cargill Dow⁹ – a bioplastic**

White Biotechnology can be used to produce a biodegradable plastic, reducing dependency on fossil inputs by 25-55% and reducing green house gasses by 10-78% today, compared with competitive fossil resource based polymers. (Figures are valid for cradle-to-factory gate).

5. **DuPont¹⁰ - a new biobased polymer** (assessment by Five Winds International)

White Biotechnology can be used to make one of the key ingredients for a new polymer for textiles using dextrose from corn and cutting the use of fossil inputs by 50%.

These biobased polymers are currently competitive in niche applications, but their success will depend on the price of sugar, starch and vegetable oils – the natural feedstocks needed for bioprocesses.

6. Future scenario - Bio-fuels and bio-chemicals (assessment by the Oeko-Institute)

If White Biotechnology is used to produce ethanol for fuel and ethylene for plastics, the latter being the largest volume bulk chemical produced by the chemical industry, a reduction of up to 100% in fossil fuel CO₂ emissions could be achieved. However, the process is not economically viable. A breakthrough such as biomass conversion to sugar, starch or oil, the biological feedstocks necessary for bioprocesses, would be a major cost reducing factor.

Notes to Editors

1. EuropaBio has about 35 corporate members operating worldwide and 21 national biotechnology associations representing some 1200 SMEs involved in research and development, testing, manufacturing and distribution of biotechnology products. www.europabio.org
2. DSM is the leading producer of life science products, performance materials and industrial chemicals. With its head office in Heerlen, the Netherlands, DSM's annual sales are approximately € 6 billion, and the company employs about 20,000 people at more than 200 sites across the world <http://www.dsm.com>
3. What is white biotechnology? http://www.europabio.org/pages/module_17.asp
4. Independent Peer Reviewers
 - a. Öko-Institut a registered non-profit association that conducts environmental research independent of government and industry, for the benefit of society. <http://www.oeko.de/>
 - b. Five Winds International is a small environmental-management consultancy, founded in 1998 and serving clients in North America, Europe and Asia. www.fivewinds.com
 - c.
5. OECD report finds that biotechnology contributes to industrial sustainability <http://www.oecd.org/EN/document/0,,EN-document-27-nodirectorate-no-12-21620-27,00.html>
6. Novozymes A/S is a biotech-based world leader in enzymes and microorganisms for industrial use. With headquarters in Denmark, Novozymes employs more than 3,700 people in 27 countries. www.novozymes.com
7. Genencor International is a diversified biotechnology company that develops and delivers protein-based products and bioprocessing services into the healthcare, agri-processing, industrial and consumer markets. Founded in 1982, Genencor's annual revenue for 2002 was over \$350 million and the company employs about 1,300 people in eight manufacturing sites around the world. www.genencor.com
8. BASF is the world's leading chemical company with sales of 32.5 billion euros in 2001. BASF employs about 93,000 employees worldwide and operates production facilities in 38 countries. www.basf.com
9. Cargill Dow LLC, founded in 1997, is a stand-alone company based in Minnetonka, Minn., USA. It is a joint venture between Cargill and Dow. The company offers a family of polymers derived entirely from annually renewable resources. <http://www.cargilldow.com>
10. DuPont is a science company, founded in 1802 and operating in more than 70 countries. Revenues in 2002 reached \$24 billion, the company employs 79 000 employees. The company offers a wide range of products and services to markets including agriculture, nutrition, electronics, communications, safety and protection, home and construction, transportation and apparel. <http://www.dupont.com>