

# **INDUSTRIAL BIOTECHNOLOGY IN LITHUANIA**

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## **INDUSTRIAL BIOTECHNOLOGY IN LITHUANIA**

### **INTRODUCTION**

Lithuania is one of the least populated countries in the Europe with highly developed agricultural and forestry sectors. The annual production of grain is over 3 mln. tons of which around 1.0 mln. tons are redundant. Each year more than 4.5 million tons of residual biomass and waste products of stockbreeding are produced. More than 2.5 million m<sup>3</sup> of forestry residues are formed during wood manufacturing. There are still remaining areas of unused land which could produce more than 1 mln. ton of plant biomass. These numbers clearly indicate that Lithuania has enough feedstock of biomass for the first stage for development of industrial biotechnology. In the future, the biomass yield potential can be increased by developing special plant types that can be used as sources of renewable raw materials.

There are a number of research institutions which perform modern biotechnological investigations, related to industrial biotechnology: Institute of Biotechnology, Institute of Biochemistry, Institute of Chemistry, Lithuanian Institute of Horticulture, Lithuanian Institute of Agriculture, Kaunas Technical University, Lithuanian University of Agriculture, Vilnius University, Vilnius Gediminas Technical University and others. The strong research centers are developed in private biotech companies: "Fermentas", Sicor Biotech", "Biocentras", "AMILINA". There is a strong long-lasting education experience in training the specialists for the field of biotechnology.

In a few past years Industrial biotechnology became a rapidly growing sector of Lithuanian economy, especially production of biofuels.

## I. RESEARCH AND INNOVATION

### A. Public research funding

In order to encourage investment in the prospective technologies and R&D and support new technology-based business development, in October 2006 the Lithuanian Government has approved the National Industrial Biotechnology Development Programme for 2007-2010 (€ 8.7 million). During 2007 – 2009 this programme was managed by the Lithuanian State Science and Studies Fund. Since 2010 it is managed by Research Council of Lithuania. The objectives of the Programme are the following:

- to develop technologies for obtaining chemicals from biomass;
- to develop biotechnological products and biodiagnostic methods for industry, agriculture, and healthcare;
- to explore and to develop biocatalysts and biotechnological processes;
- to use local materials suitable for industrial biotechnology more effectively and to develop new biomass sources.

Since the beginning of the programme 23 projects have already received funding. € 1.2 million were allocated in 2007, € 1.7 million in 2008 and € 1.8 million in 2009. Funding is allocated for the projects submitted by research institutions together with business entities.

Support for biotechnology (agri-food, healthcare and industrial) is also available in the High technology development programme. € 1.5 million is allocated for biotechnology of the total amount of € 9.7 million of High Technology programme in the period 2007-2009.

### B. Pilot and demonstration plants

#### i. pilot plants

##### a) Open to all

#### Kaunas

<b>Lithuanian Agricultural University</b>	
General, products;	Biodiesel and biogas production;
Feedstocks	Rapeseed and other seeds, agricultural and industrial waste
Services	
Financing	National +EU
Contact	Prof. Violeta Makarevičienė, tel.: +370 611 10653, e-mail:violeta.makareviciene@lzuu.lt

##### b) Partly restricted

#### Vilnius

<b>JSC Biocentras</b>	
General,	Enzymes and other fermentation products,

products; Feedstocks	
Services	Fermentation, enzymatic processes, bioremediation;
Financing	Private + National + EU
Contact	Dr. Saulius Grigiškis, tel: +370 5 2661313, e-mail: biocentras@biocentras.lt

### **Panevėžys**

<b>AMILINA, AB</b>	
General, products; Feedstocks	Technical starch and other starch products; vital wheat gluten Wheat grain
Services	Production and transformations of starch and other biopolymers
Financing	Private
Contact	Dr. Danas Tvarijonavičius, mob.: +370 698 20494, e-mail: d.tvarijonavicius@amilina.com

#### **c) Restricted**

**There is no**

- ii. demonstration plants

#### **a) Open to all**

**There is no**

#### **b) Partly restricted**

**There is no**

#### **c) Restricted**

**There is no**

## **II. POLICY**

### **A. Policies and regulations**

In July 2002 the Government of Lithuanian republic adopted resolution on the priority directions of R&D in Lithuania. Biotechnology was declared as one of the priorities.

In July 2006 was established the Lithuanian National Biotechnology Platform (LNBP). The formation of LNBP was initiated by the Lithuanian Biotechnology Association. The platform gathers together 13 academic partners and 15 industrial partners. These industrial partners are the fast growing sector of Lithuanian economy (the annual growth of sales in 2006 and 2007 equals 40 %. Total production was € 338 mln. in 2007. The platform distinguishes two main priority areas:

- *Industrial biotechnology and agro-biotechnology.* The objectives in this area are to reduce the dependence of Lithuania upon the imports of non-renewable raw materials via a more efficient utilization of the available agricultural and forestry resources, reduction of environmental pollution and the “green-house” effect, and the expansion of the share of modern technologies in the Lithuanian economy.
- *Pharmaceutical biotechnology, products for molecular biology and diagnostics.* This area of activity covers the development of production and practical application of the most modern medicaments and diagnostic tools.

The LNBP is involved in the drafting of the long-term strategy for the development of the Lithuanian sector of the industrial biotechnology and pharmaceutical products. Also the problems of feedstock for the biotechnology industry is an object of LNBP activity in the form of a social consensus and established on a three-pillar basis (business, science and the State). The strategy seeks to ensure the proper coordination of distribution of private and public resources conducive for the development of economy of Lithuania. The LNBP serves as a tool to define the medium-term and long-term RTD objectives of the Lithuanian biotechnology sector and to identify the principal activities necessary for the attainment of such objectives.<sup>1</sup>

National **Industrial Biotechnology Development Programme** for 2007-2010, approved by the resolution No 1050 of 24 October 2006 of the Government of Republic of Lithuania. Budget of this programme is 30 million litas (2,975 million litas for 2010). Since the program ends this year the Government is considering the possibility to continue program for the next period.

Joint Natural resources and agriculture Research Programme, approved by Order No ISAK-2377 of 24 November 2009 of the Minister of Education and Science.

- Budget of this programme is 346,741 million litas till 2013 year.
- This programme includes such valley projects as:
  - ✓ Development of R&D centres of agrobiotechnologies, forestry, biomass energy, water and biosystem engineering, higher education and studies and related infrastructure, and reorganisation of science and studies institutions in “Nemunas” valley in Kaunas;
  - ✓ Creation of a maritime valley hub and renovation of the studies infrastructure in Maritime valley in Klaipėda;
  - ✓ Establishment of a Joint Nature Research Centre in “Santara” valley in Vilnius.

## **B. Public procurement**

The Green public procurement programme which encourages institutions to buy eco-friendly goods was approved by the Government of Lithuania in 2007. Green procurement amounted to 8,3 percent of all public purchases in 2008. Following the Strategy of the Development and Improvement of Lithuanian Public Procurement System for 2009-2013 approved by the Government of Lithuania the share of green public procurement should equal 25 percent of total public purchases in 2013.

## **C. Standardisation, labelling and certification**

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<sup>1</sup> [http://www.tpa.lt/ENG/FP7/files/NTP\\_platforms.pdf](http://www.tpa.lt/ENG/FP7/files/NTP_platforms.pdf)

Lithuania is a big producer of ecological food products and their labelling is established and used already for relatively long time.

“**Water lily**” was designed in Lithuania to mark eco-friendly non-food products. But its use is rather limited because there is no much of such products.

#### **D. Access to finance**

There are mainly three ways of supporting biotechnology innovation in Lithuania.

- Through legal environment improvement: recent amendments aimed notably to encourage companies to invest in R&D through financial incentives; to establish legal basis for Universities and science institutes to create spin-offs and encourage them to commercialise results of their research through patenting;
- Through financial assistance via EU structural funds (economical growth, R&D development) and national funds (the Industrial Biotech development programme and High Technology development programme);
- Through tax incentives: Profit tax amendments for investments into R&D: tax relief for investments into technological renew (assessable profit for the enterprises could be reduced up to 50 % of expenditures incurred by investing into equipment, means of communication, computers, etc.), expenditures for R&D reduce taxable income 3 times and amortization process is reduced to 2 year period. Approved by the Government in 2008 year.

In 2008, the Lithuanian Government approved five “Integrated Science, Studies and Business Centres” (valleys). Valleys are complex infrastructures that shall realize and re-enforce the strengths of regionally concentrated, sustainable research and innovation networks with clear and long-term commitments by universities, state institutes and companies.

Out of five planned Valleys - “Santara” and “Nemunas” – among other areas, will focus on biotechnologies:

1. *Santara* – Biotechnology, Molecular Medicine & Biopharmacy; Research of Ecosystems and Sustainable Environment; Design, ICT;
2. *Nemunas* – Agrobiotechnology, Bioenergy&Forestry; Safe & Healthy Food Technologie.

In September of 2009 the Lithuanian Government approved group of BIO and ICT project developers of “Santara” Valley Programme, giving it the status of the economic importance to the state. This status liberates businesses from various business establishment related and other procedures and provides private investors with a right to invest, build, and register their property in a special business area, such as the “Santara” Valley. Companies setting up in this territory will able to lease a land plot to build manufacturing facilities on very favourable terms. Business of BIO and ICT sector has already expressed interest to invest nearly 90 mln. Lt into the “green field” projects to be developed in the Santara Valley. Producers of medical techniques and solar batteries are ready for investments into Visoriai Information Technology Park (VITP), located in the science and technology valley “Santara”. According to businessmen, the total value of the planned investment projects is EUR 57 million, and it is expected to create about 350 new jobs.

In October 2008 the Lithuanian Government approved the Plan of Reorganization of scientific institutions which will be joined into the valleys.

#### **E. Communication**

First of all, communication between business, science and State is actively held by Lithuanian Biotechnology Association (it was established in 1995). Additionally, in 2006, the formed Lithuanian National Biotechnology Platform (LNBP) has enhanced these collaborations. Both,

LBTA and LNBP have good working contacts with Ministry of Economy, Ministry of Education and Science, agency for international science and technology development in Lithuania.

### **III. OTHER**