INTEGRATED SCIENCE, STUDIES AND BUSINESS CENTRE

THE NEMUNAS VALLEY

DEVELOPMENT VISION

Approved by Valley Board Decition of 5 January 2008
Valley Council Chairman, LVA Rector
Prof. Hb. Dr. Henrikas Žilinskas

Valley Board Chairman, LUA Rector
Prof. Hb. Dr. Romualdas Deltuvas

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CONTENTS

The Initiators of the Integrated Science, Studies and Business Centre (Valley) of Nemunas,

having regard to the importance of activities of public authorities in the process of creation, development and functioning of the Integrated Science, Studies and Business Centre (Valley), to the extent related with the establishment of the Valley, coordination of its activities, financing or organisational integration of the Valley participants, and in particular with needs for public and private investments and provision thereof for the implementation of the Valley Development Vision,

emphasise that the obligation of the Valley Initiators to create the Valley of the type and size as described in this Valley Development Vision may be properly implemented only if the public financing necessary for the implementation of this Valley Development Vision is guaranteed,

in case the public financing is smaller than provided for under this Valley Development Vision, obligation of the Initiators to create the Valley as it is described in this Valley Development Vision will be reduced, and new obligations of the Valley Initiators will be discussed under the Valley Development Programme.

Introduction

On 21 March 2007 the Government of the Republic of Lithuania adopted the Resolution No. 321 on Approval of the Conception of the Establishment and Development of Integrated Science, Studies and Business Centres (Valleys) ("Valstybės žinios" (Official Gazette), 2007, No. 40-1489) (hereinafter the Conception), providing for the possibility of the development of the Integrated Science, Studies and Business Centres (Valleys) which would facilitate in creating in Lithuania the science, studies and knowledge-economy clusters of the international level, accelerate the development of the information society and strengthening long-term basis of competitiveness of the Lithuanian economy. The Conception recognises that scientific research and higher education capacity building, promotion of their linkages and consistency with economic and public needs is one of the key factors of competition.

The establishment of the sectoral Integrated Science, Studies and Business Centre (Valley) of Nemunas (hereinafter the Nemunas Valley) was initiated by the main institutions of science and studies of the agriculture, forestry and food sectors.

The Integrated Science, Studies and Business Centre – the Nemunas Valley – is a potential of agriculture, forestry and food scientific research, studies and knowledge intensive business (the entirety of entities) with common and network infrastructure and targeted contribution to the development of agriculture, forestry and food sectors and knowledge-based economy and enhancement of competitiveness of the Lithuanian economy.

The Nemunas Valley will be developed according to the following main programmes with are interrelated and support each other:

1. The Agricultural Valley Development Programme (on observance of the Republic of Lithuania Government Resolution No. 321 of 21 March 2007 on Approval of the Conception of the Establishment and Development of Integrated Science, Studies and Business Centres (Valleys) ("Valstybės žinios" (Official Gazette), 2007, No. 40-1489) – according to which the territorially integrated common-use infrastructure of the Valley will be formed in Kaunas (R&D[1], knowledge and technology transfer, commercialisation of research results and new business set ups).

2. The National Complex Agricultural Programme (in observance of the National Lisbon Strategy Implementation Programme approved by the Republic of Lithuania Government Resolution No. 1270 of 22 November 2005 ("Valstybės žinios" (Official Gazette), 2005, No. 139-5019) – according to which the R&D network infrastructure of the agricultural, forestry and food sectors will be formed in the institutions of science and studies participating in the activities of the Nemunas Valley, R&D projects will be implemented and the development of human resources will be carried out. In this case the R&D network infrastructure comprises the necessary R&D infrastructure in Babtai, Dotnuva, Baisogala and Girionys (increase of agriecology and plant potential, plant biotechnology, agrochemical research, forestry, animal nutrition, biotechnology and other research centres, for more detail see Section 4 (Structure of the Valley) and Subsection 5.1 (Establishment of the Valley), the territorial integration of which is economically ineffective and inexpedient, but this infrastructure is related with the territorially integrated Valley infrastructure being created in Kaunas.

[1] Research and development.

3. **Other R&D and infrastructure financing programmes**, according to which the Valley infrastructure might be financed and R&D projects might be implemented by the Valley participants.

These programmes are interrelated and will supplement each other concurrently forming the effectively functioning Science, Studies and Business Centres – the Nemunas Valley.

The area covered by the Nemunas Valley: agriculture, forestry and food sector including the following activities according to the Classification of Economic Activities (NACE):

• 01. Agriculture, hunting and related service activities (including crop production, livestock farming, part of biomass preparation).

• 02. Forestry, logging and related service activities (including part of biomass preparation).

• 15. Manufacture of food products and beverages (processing of agricultural products and semi-finished products to end-products).

The Initiators of the Nemunas Valley are the main institutions of science and studies of the agriculture, forestry and food sectors, the total income of which earned during past 3 years from research and development (hereinafter R&D) works outsourced by business entities account for 18% of total funds earned by all institutions of science and studies of the country. Total income of the past 3 years received for the international R&D works account for about 12 % of total funds earned by the institutions of science and studies of the country. Moreover, income generated by the Valley Initiators during past 3 years for the R&D works outsourced by business entities and for the international R&D works account for 100% of total funds earned by the institutions of science and studies of the country for the aforementioned works.

The following business entities participate in the establishment of the Valley: UAB koncernas Achemos grupė, UAB Arvi ir ko, AB Kauno grūdai, Lithuanian Biofuel Producers and Suppliers Association LITBIOMA, AB Utenos mėsa, Lithuanian Association of Land Reclamation Enterprises, UAB Vakarų medienos grupė, Baltic AgriBusiness Institute. Representatives of the diary products processing sector (AB Pieno žvaigždės), UAB Dotnuvos projektai and large farmers are also going to contribute to the establishment of the Valley (in addition to the aforementioned businesses). In such a way the main areas of agriculture, forestry and food sectors will be represented in the Valley.

The Nemunas Valley will be used to concentrate research potential of agriculture, forestry and food sectors and business representatives related with these activities, to improve the system of science and studies, develop R&D works linked with the Valley development trends, to create and implement innovations which might generate the greatest benefits to the growth of the country's economy and social environment.

The breakthrough is envisaged in the areas of **biomass and food products**. The most perspective technology development trends are the following:

o creation of safe and competitive crop production and livestock farming and keeping technologies;

o plant and animal genetics, biotechnology and selection;

o guaranteeing food quality, creation of modern technologies and innovative products;

o biomass for energy purposes and renewable energy sources, sustainable environment.

In observance of the Republic of Lithuania Government Resolution No. 321 of 21 March 2007 on Approval of the Conception of the Establishment and Development of Integrated Science, Studies and Business Centres (Valleys), the Practice Statement on the Selection and Evaluation of the Integrated Science, Studies and Business Centre (Valley) Visions and Draft Valley Development Programmes approved by Order No. ISAK-1118/4-231 of 5 June 2007 of the Minister of Education and Science of the Republic of Lithuania and the Minister of Economy of the Republic of Lithuania and other related legal documents, the Initiators of the Nemunas Valley have prepared the Valley Development Vision covering the review of the need and benefits of the creation of the Valley, its conformity to the national policy goals, implications for the competitiveness of the Lithuanian economy, envisaged organisational integration of the Valley participants, joint scientific research, cooperation, contribution of private Valley development partners and obligations and provides other related information. The prepared Development Vision of the Nemunas Valley was positively evaluated by the Lithuanian and foreign experts.

This Valley Development Vision has been adjusted having regard to the recommendations from the Ministry of education and Science of the Republic of Lithuania approved by the Integrated Science, Studies and Business Centres (Valleys) Development Commission as well as in consideration of comments, observations and proposals provided by the Lithuanian and foreign experts highlighting strategic targets for the Lithuania as a whole, such as the organisational integration of the Valley participants or formation of linkages between academic and business community.

1. Analysis of the current situation, main problems and public needs

In recent years the economy of Lithuania experienced rapid growth (in 2004–2006 annual change of gross domestic product (GDP) was 7.3–7.5%). According to the data of Statistics Lithuania, GDP estimated in H1 2007 stood at LTL 43,552 million at current prices and compared with H1 2006 increased by 8.1%. In Q2 2007, GDP totalled LTL 23,763 million at current prices or was by 8% larger than in Q2 2006.

Irrespective of good economic results of recent years future forecasts are less optimistic. In the long-term period the Lithuanian economy might be negatively affected by Lithuania's manufacturing oriented towards low and medium-high technologies, inability to create and implement innovations which is the driver of current economy.

the National Lisbon Strategy Implementation Programme approved by the Republic of Lithuania Government Resolution No. 1270 of 22 November 2005 ("Valstybės žinios" (Official Gazette), 2005, No. 139-5019) recognises that "lack of activity of businesses in investing in R&D&I might have serious consequences for the long-term development of business in Lithuania and growth of its economy". The main identified problems which have caused such a situation are as follows:

1) business rarely uses the results of the country's R&D system, because of very weak links between scientific research trends and business development and needs;

2) the system of science and studies is still very passive in responding to the long-term development needs of the state, the country lacks highly qualified specialists satisfying modern industry and business needs;

3) investments of business in R&D are low and incentives for business to invest in R&D are insufficient;

4) higher schools and research bodies do not generate new innovative businesses.

For the purpose of creating and developing a modern, dynamic and competitive economy, it is necessary to guarantee a full-fledged consolidation of the country's R&D&I system and building of its potential. Investments in the creation and implementation of innovations would contribute to the development of knowledge-based economy and increase of competitiveness of traditional sectors of economy, as well as development of the manufacturing of higher value added products.

The spheres of Lithuanian economy with scientific and industrial potential which must be developed and the productivity of which must be increased are agriculture, forestry and food sector (including crop production, livestock farming and bioenergy).

The Research and Development Programme of 2007–2013 for Agriculture, Food Sector and Rural Development approved by Order No. 3D-328 of 10 July 2007 of the Minister of Agriculture of the Republic of Lithuania ("Valstybės žinios" (Official Gazette), 2007, No. 83-3403) specifies that "natural conditions, infrastructure, intellectual potential and experience accumulated in Lithuania allows developing crop production, livestock farming, animal breeding, gardening and horticulture, fisheries, growing of technical and bioenergy crops, and developing organic farming." Ability to implement the most state-of-the-art technologies, foster innovative business for the development of competitive processes and products should become the basis of competitiveness of agriculture, forestry and food sector.

At present macroeconomic indicators of agriculture are improving: gross agricultural output as well as volumes of trade in agricultural and food products are growing. Gross added value created in 2005 in agriculture and sectors servicing it together with the industry of food products and beverages stands at 9.0% of GDP. The share of agricultural and food products accounted for 12.8% of total export, foreign trade balance was positive and exceeded LTL 0.5 billion; however the country's labour productivity is very low and in 2005 it was by 4.8 times lower than EU15 average.

Separate sectors related with agriculture have great influence on the economy of Lithuania. For example, at present forests make up 7.5% of the value of the national worth of Lithuania. About 4% of GDP of Lithuania is created in forestry and 10% of added value of Lithuania – by wood industry products. Forestry comprises 220,000 private forest owners and 52,000 of wood industry and forestry employees. This is one of the most rapidly growing economic sectors of Lithuania, which has a positive export and import balance.

Another perspective area is bioenergy. Until present biomass was mostly used for food and feed, but recently its use for bioenergy, rather than food, has increased. Such tendencies are stimulated by efforts of environmentalists to reduce emissions of gases causing the green-house effect and climatic change and excess of food products in the EU Member States. Lithuanian committed unto replace 12% of general and 7% of electric energy with renewable energy resources comprising 80–90% of biomass by 2010. In 2004, in implementing the provisions of Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport, Lithuania adopted the Law on Biofuel, Bio Motor Fuel and Bio-Oils ("Valstybės žinios" (Official Gazette), 2004, No. 28-870) and the Programme for the Promotion of Biofuel Generation and Use in 2004–2010 regulating its implementation ("Valstybės žinios" (Official Gazette), 2004, No. 133-4786), envisaging to replace 5.75% of fuel used by transport with bio motor fuel by 2010. For the purpose of implementation of

these obligations three Baltic States signed the Memorandum aimed at the coordination and development of joint efforts in the sphere of generation and use of biofuel and bio motor fuel. It is forecasted that already by end-2008 production capacities of 400,000 tons per year of bio motor fuel (bio-ethanol and bio- diesel) will be put into operation. It is also envisaged that by 2020 Lithuania will be able to generate up to 750,000–760,000 of bio motor fuel.

Food industry being closely related with agriculture at present has sufficiently good infrastructure and is implementing advanced production technologies. However, in order to guarantee the safety and quality of food products, it is very important to supply industrial enterprises with raw materials of good quality which to a great extent depends upon technologies used in the primary chain – farmers' holdings and agricultural enterprises. The added value of the food sector of Lithuania should be increased through promotion of the development of new products and further improvement of production processes.

R&D works in the area of agriculture, forestry and food sector are carried out by three institutions of higher education and studies with about 1,500 of students graduating from them every year. They are the Lithuanian University of Agriculture, the Lithuanian Veterinary Academy, and Kaunas University of Technology (technologies of food products). There are also 8 research institutes the scientists and researchers of which carry out research on different subjects. These bodies carry out unique R&D works of the national and international level aimed at creating new technologies and implementing them in agriculture, forestry and food sector. These technologies are unique because they are adapted to the natural and climatic conditions of Lithuania and its specific regional needs.

Lithuania has a well-developed research network of agriculture, forestry and food sector and trains specialists of different areas. Institutions of science and studies related with these R&D trends employ a great number of qualified scientists and pedagogues with professional experience. However these institutions also have numerous problems: the infrastructure of science and studies is often inconsistent with modern requirements, R&D activities lack financing and cooperation between business and academic community is insufficient. Consequently there is a need to focus available resources on the most perspective trends į of agriculture, forestry and food sector ensuring thereby a complex solution of problems and performance of research relevant for the development of economy. Furthermore, with the companies of agriculture, forestry and food sector becoming larger, the need to apply high technologies and innovations in this traditional sector of economy of Lithuania is continuously growing.

2. Strategic goals

Vision of the Nemunas Valley: to create the effectively functioning integrated science, studies and business centre of agriculture, forestry and food sector engaged in R&D of the international level necessary for the improvement of competitiveness of the national economy and for its sustainable development.

Mission of the Nemunas Valley: to mobilise the research and studies potential, human resources and R&D infrastructure of agriculture, forestry and food sector for the performance of perspective works in the spheres of agrobiotechnology, bioenergy, forestry, food technology, safety and health promotion areas, training of highly qualified specialists and knowledge transfer to private business ensuring sustainable development of Lithuania's economy.

Strategic goal – developing the available base to create a sectoral integrated centre of science, studies and business – the Nemunas Valley – following the best examples of the foreign university research centres:

• having in place the infrastructure necessary for carrying out the public and private research, the setting up and operation of knowledge intensive businesses;

• providing knowledge intensive services creating added value;

• maintaining contractual inter-institutional ownership and property management relationships;

• contributing to scientific research activities and cooperation with agricultural business and industry, supporting the development of new business start ups;

• training specialists of required qualifications.

For the purpose of achieving these goals the fulfilment of the following **tasks** is envisaged:

1) to create the integrated science, studies and business centre – the Nemunas Valley, comprising the concentrated common use Valley and network infrastructure of the centres;

2) to concentrate the academic potential of science and studies institutions in the centres of competence of the Valley, optimising their synergy;

3) to carry out joint R&D works according to the identified development trends of the Valley;

4) to facilitate the setting up of innovative knowledge intensive businesses in the territory of the Valley (spin offs from subdivisions of the institutions of science and studies, groups of researchers or on other grounds) and attract Lithuanian and foreign investments;

5) to develop the infrastructure of studies aimed at training highly qualifies specialists of the agriculture, forestry and food sector.

Development trends of the Nemunas Valley (R&D):

1. Agrobiotechnology, bioenergy and forestry;
2. Food technologies, safety and health promotion.

3. Initiators and Participants of the Valley

Founders of the Nemunas Valley (founders – institutions intending to set up science and studies centres of common use on their base, initiating R&D activities in the directions of the development of the Valley) – the main institutions of science and studies of the Lithuanian agriculture, forestry and food sector and research institutes:

1) **The Lithuanian University of Agriculture** (the Initiator, hereinafter **LUA**) – is a public institution of higher education training highly qualified specialists of agriculture, forestry and aquaculture and carrying out scientific research related with these spheres. LUA has set up a successfully functioning Agricultural Science and Technology Park aimed at raising the general level of rural culture through promotion of scientific innovations and implementation of new technologies, and upgrading skills of improving specialists of agriculture, forestry and aquaculture and Lithuanian farmers. Education of LUA students as well as the transfer and adaptation of modern technologies under conditions of Lithuania is carried out by LUA Experiment Station and LUA Training Farm.

2) **The Lithuanian Veterinary Academy** (the Initiator, hereinafter **LVA**) – a public institution of higher education highly qualified veterinary doctors, veterinary food safety specialists and animal husbandry technologists, and performing research in veterinary medicine and zootechnics.

3) **The Water Management Institute of LUA (WMI LUA)** – a university research institute whose mission and strategic goal is improvement of water management of the agricultural sector.

4) **The Institute of Agriculture Engineering of LUA (IAE LUA)** – a university research institute performing research of mechanical and chemical environmental impact of agricultural technologies, renewable energy resources and plant production and its waste recycling to generate non-food material.

5) **The Institute of Animal Science of LVA (IAS LVA)** – a university research institute which is the main zootechnics research body in the area of biomedical sciences in Lithuania. He Institute engages in scientific research related with the improvement of animal breeds, selection, breeding and reproduction methods, preservation of the genofond (gene pool) of ancient breeds, animal nutrition, feeding and production and preparation of feed, animal welfare and the environmental impact of the livestock farming.

6) **The Veterinary Institute of LVA (VI LVA)** – a university research institute the mission of which is to carry out scientific research in the areas of veterinary medicine biotechnology, ecology and food safety.

7) **The Lithuanian Institute of Horticulture and Gardening (LIHG)** – a state research body, mainly engaged in the development of plant biology and biotechnology fundamentals, multiplication of garden and orchard plants, investigation, preservation and enrichment of their genofund, agrobiologic and ecological investigations of orchard and garden plants, development of production and growing technologies, investigation of fruit, berry and vegetable quality, optimization of their storage and processing, creation of biologically valuable products, applying biological variety of orchard and garden plants.

8) **The Lithuanian Institute of Agriculture (LIA)** – a state research institute mostly engaged in R&D works in the areas of soil science, agriculture, agrochemistry, horticulture, plant protection, apiculture, plant genetics, selection, biotechnology, agriecology and rural development.

9) **The Lithuanian Forest Research Institute (LFRI)** – a state research institute the mission of which is fundamental and applied forest research to obtain new knowledge for the purpose of social, ecological and economical country development, and training specialists of forest and environmental sciences.

10) **The Food Institute of KUT (FI KUT)** – a university research institute the main trends of scientific research of which include: investigations of the systems of management and control of food quality and safety and good quality and safe food technologies.

11) The Food Product Technology Department of KUT – the Department of the Faculty of Chemical Technology of Kaunas University of Technology training specialists for food industry and public catering, food quality control and research bodies, carrying out analyses of bread, cereals and farinaceous confectionery, meat and diary products, heavy metals in food, technological tests of fermentation products, etc.

The Nemunas Valley will concentrate research potential of agriculture (plant production, livestock farming, bioenergy and water), forestry and food sector of Lithuania. Indicators of the aforementioned institutions of science and studies are summarised in Table 1 (for more information see Annexes).

Table 1. Summary indicators of the Valley Founders – institutions of science and studies

Seq. No.	Indicator	The Nemunas Valley	Share at the Lithuanian level[2]
1.	Number of students in 2006	9,406	~ 8%
2.	Number of graduates in 2006	1,476	no data
3.	Number of scientists and researchers in 2006	1,024	~ 10%
4.	Articles published in magazines included in ISI List, units, in 2006	279	~ 20%
5.	Articles published in magazines included in ISI List, units, in 2002–2006, total	616	no data
6.	Income from works with business entities of Lithuania, in 2006	2.55	~ 15%

Total income earned by the Valley Founders (science and studies institutions) during the past 3 years for R&D works outsourced by business entities make up 18% of total funds generated by all science and studies institutions of Lithuania. Total income of the past 3 years earned from international R&D works account for about 12% of total funds generated by all science and studies institutions of Lithuania[3]. Total income of the past 3 years earned from R&D works performed on order of business entities and at the international level make up 100% of total income generated by all science and studies institutions for the aforementioned works. Therefore, the Nemunas Valley will be the largest centre of science and studies institutions of applied type in Lithuania in the area of agricultural, forestry and food sector.

Business representatives participating in the establishment of the Nemunas Valley:

[2] Indicators of science and studies institutions participating in the Valley compared with the indicators of all science and studies institutions of Lithuania.

[3] The indicators of the Valley Founders – science and studies institutions (including the share of KUT which is related with the Valley development trends and food technologies) are based on data of the Ministry of Education and Science.

1) **The Concern UAB koncernas Achemos grupė**. The Concern represents the following companies: AB Achema, UAB Krovinių terminalas, UAB Renerga, UAB Agrochema, AB Aušra, AB Naujoji rūta and AB Gliukozė, UAB Druslita and UAB Radnyčėlė, and foreign companies: Litfert (France), Iremas GmbH (Germany), Agrochema Eesti OU (Estonia), SIA Agrochema Latvia (Latvia), Agrobaltic GmbH (Germany), Sp.z.o.o. Liteximp Prostki (Poland) etc. The Concern Achemos grupė – is third by size and one of the most intensively investing company among Lithuanian companies.

Earnings of the Concern Achemos grupė (including its associates), LTL million: in 2004 – 1,463; in 2005 – 2,102; and in 2006 – 2,564.

Investments of the Concern Achemos grupė, LTL million: in 2004 – 213; in 2005 – 345; and in 2006 – 451.

UAB Achema investments in the scientific research infrastructure during the period of 2001–2005 stood at LTL 5.55 million. The research-experimental laboratory set up in 1996 has been provided with equipment, devices and other research inventory of over LTL 1.0 million value.

2) **UAB Arvi ir ko. ARVI Group** – the largest in Lithuania group of companies of the agricultural and food product sector of the Lithuanian capital. ARVI companies are successfully operating in the areas of manufacture and trade of fertilizers, feed and sugar, production and processing of turkey meat, processing of waste or animal origin, manufacture of diesel fuel, cargo forwarding, business consulting, accommodation and catering services.

ARVI Group comprises 22 companies. ARVI activities are not limited to Lithuania: it has its companies operating in Romania, Ukraine, Russia, Cyprus, Croatia and Serbia. The largest and most widely known companies of this Group are Arvi kalakutai, Arvi cukrus, Arvi fertis, Rietavo veterinarinė sanitarija, Marijampolės pašarai and other. Turnover of ARVI companies totals LTL 655 million (2006); the Company has created 2,400 jobs (2007).

3) **AB Kauno grūdai.** At present AB Kauno grūdai alongside AB Vilniaus paukštynas and AB Kaišiadorių paukštynas represents the one of the most modern and economically strongest associations in Lithuania – the Group of Kauno grūdai companies.

The monthly amount of compound feeding stuffs for animals and birds and poultry birds produced by AB Kauno grūdai totals about 15,000 t. The output of the Company is exported to Belarus, Poland, Latvia and Great Britain. In 2005, AB Kauno grūdai occupied 42% of the wheaten flower market, 36% of the compound feeding stuffs market and 10% of the dog food market of Lithuania. AB Kauno grūdai income from sale totals LTL 168,444 million (2005), and investments – LTL 8,546 million (2005).

4) **UAB Utenos mėsa**. It is one of the largest meat processing enterprises in Lithuania. UAB Utenos mėsa represents Biovela Group which comprises 5 meat processing enterprises in Lithuania (Biovela, Utenos mėsa, Makvela, Žiobiškis Complex of Breeding Pigs, UAB Maisto pramonės logistikos grupė). The Company produces different meat products of about one hundred types. About 40% of the company's output is exported outside Lithuania. On a monthly basis the company produces 900 t of meat products of 120 names, cuts 650 t of beef, and 480 t of pork and produces more than 1000 t fresh meat and semi-finished products. The company employs 1,500 employees. It has a modern laboratory of food quality and safety. The company's specialists are actively involved

in cooperation with specialists of educational establishments and research centres: shares experience and mutual consultations during workshops, consultations and training courses.

5) **The Lithuanian Biofuel Producers and Suppliers Association LITBIOMA**. At present LITBIOMA unites 19 members of which 15 produce biofuel. In 2005, the companies participating in the Association produces and supplied to the heat produces of Lithuania two thirds of all biofuel produces and used in Lithuania – more than 1 million cubic metres of output. The company of the Association UAB Rapsoila successfully engages in generation of biodiesel fuel from locally produced rape seed. In February 2006, LITBIOMA became a member of the European Biomass Association (AEBIOM).

UAB Bionovus, which is one of the largest companies of LITBIOMA, started biofuel generation in 2005. During the last two years independent subdivisions of biofuel generation and energy crops production plantations have been set up. LTL 4.6 million were invested in the new equipment. The main output produced by the company is wood chips and mixtures with straw and peat. In the area of R&D the Company cooperates with the Lithuanian and foreign research bodies.

6) **UAB Vakarų medienos grupė (VMG)**. It is a vertically integrated group of enterprises producing chipboard and furniture. VMG holds controlling blocks of shares of companies producing chipboard, furniture and plywood. VMG controlled companies: AB Klaipėdos mediena, UAB Girių bizonas and UAB Sakuona. VMG is the largest chipboard manufacturer and exporter in the Baltic States. VMG turnover of 2006 stood at LTL 250.5 million. It is forecasted to amount to LTL 391.8 in 2007.

7) **The Lithuanian Association of Land Reclamation Enterprises**. The Association represents 67 enterprises of which 56 are construction companies, 3 – specialised construction industry companies, 4 companies engaged in designing activities and 4 companies – in other activities. The Association is a member of the Chamber of Agriculture of the Republic of Lithuania and the Confederation of Lithuanian Industrialists, cooperates with the Lithuanian Union of Land Management and Hydrotechnology Engineers, the Lithuanian Builders Association and maintains relationships with related foreign organisations.

8) **The Baltic AgriBusiness Institute (BAVI)**. BAVI promotes competitiveness in agricultural business, rural development and aims at settling economic and social problems with joint effort and informing the public. With the involvement of experienced experts the Institute initiates local and international cooperation, promotes local and foreign investments in agricultural business and creates its attractive image. Since activities of BAVI are based on the dialogue between agricultural, industrial, scientific and public bodies and the public, it performs research and studies of the agricultural business, prepares and implements investment and training projects, provides economic and social development policy proposals.

Having established the Nemunas Valley cooperation will be maintained not only with the aforementioned companies, but also with other enterprises, representatives of small and medium-sized business and farmers. Representatives of diary products processing sector (AB Pieno žvaigždės), UAB Dotnuvos projektai, and large farmers are also going to joint to the setting up iof the Valley (in addition to the aforementioned companies). In such a way the main areas of agriculture, forestry and food sectors will be represented in the Valley.

The following associations support the initiative of the establishment of the Nemunas Valley (approval letters are enclosed):

1. **The Chamber of Agriculture of the Republic of Lithuania**. The Chamber is the association of more than one hundred territorial and sectoral organisations of farmers, agricultural processing companies and other non-profit organisations participating in the economic and social life in rural areas.

2. **The Lithuanian Confederation of Industrialists (LCI)**. At present LCI includes 38 sectoral and 8 regional associations uniting more than 2,700 companies of different profile. In addition to the great majority of industrial enterprises the Confederation also comprises banks, trade companies, representative offices of foreign firms, research institutes, and health care establishments. Activities of LCI members cover all main branches of industry – practically all good produced in Lithuania comprise their output.

3. **The Association of Lithuanian Chambers of Commerce, Industry and Crafts**. It is a voluntary organisation hosting under its umbrella the Chambers of Commerce, Industry and Crafts representing the interests of Chambers. The main functions of the Association are to promote foreign trade, support small and medium-sized business, provide information about business proposals of foreign companies, look for foreign partners, etc.

4. **The Lithuanian Veterinary Association**. In end-2003, the Association had 1,140 members. The purpose of the Association is to unite the veterinarians, support the veterinary science, education and practice, inform the public about achievements of the veterinary medicine, and protect professional, social, economic and academic interests of the Association members. One of the principal tasks of the Association – provide full support for the veterinary science, education and practice, aim at the improvement of health of animals and ensure their proper keeping; take care training of the veterinarians.

5. **Other associations of Lithuania** – the Union of Lithuanian Zootechnicians and the Lithuanian Association of Agricultural Companies.

The establishment of the Nemunas Valley is also supported by the National Technology Platforms of the Production and Use of Future Plants, Biomass and Biofuel, Animal Health and Welfare, Food Sector, Forestry, and the National Food Cluster. Close cooperation will be maintained with the aforementioned technology Platforms, the National Food Cluster and bodies participating in their activities.

The largest business entities of Lithuania related with agriculture, forestry and food sector, business associations and technology platforms and clusters related with the spheres of activity of the Valley are also involved in its establishment. Their involvement will guarantee the full-fledged representation of business in the activities of the Valley.

4. Structure of the Valley

The result of implementation of planned activities of partners will be the establishment of the Nemunas Valley with the territorially integrated infrastructure of common use (suitable for carrying out a great majority of the development trends of the Valley) and the network infrastructure of competence centres (oriented towards specific branches of industry and areas of science). The organisational chart of the Valley is provided in Figure 1.

<table>
<tr><td colspan="4">The Nemunas Valley</td></tr>
<tr><td colspan="2">Centre of Competence for Agro-biotechnology, Bioenergy and Forestry</td><td colspan="2">Centre of Competence for Food Technology, Safety and Health</td></tr>
<tr><td>Centre for Science and Studies in Agro-ecology and Promotion of Bio-potential of Plants (LUA, LIA, LIHG)</td><td>Bioenergy Research and Studies Centre (LUA)</td><td colspan="2">Centre for Quality of Animal Health and Raw Materials of Animal Origin (LVA, LVA VI, LVA IAS)</td></tr>
<tr><td>Centre for Biotechnology of Plants (LUA, LIHG, LIA)</td><td>Biosystem and Water Engineering Research and Studies Centre (LUA, IAE, WMI, AI, etc.)</td><td rowspan="2" colspan="2">Innovative Food Technology Centre (LVA, LUA, KUT, FI KUT, LIHG, etc.)</td></tr>
<tr><td>Centre for Animal Nutrition and Biotechnology (LVA, LVA VI, LVA IAS, LUA)</td><td>Agrochemical Research Centre (LUA, LIA)</td></tr>
<tr><td>Forestry Research, Studies and Development Centre (LUA, LFRI)</td><td>Centre for Agro-innovation Economy and Management (LUA)</td><td colspan="2"></td></tr>
<tr><td colspan="4">Joint Communication and Technology Transfer Centre of the Valley</td></tr>
<tr><td colspan="2">Agricultural Science and Technology Park</td><td>Scientific Library and Database of the Valley (LUA, LVA)</td><td>Animal Science Technology Park</td></tr>
<tr><td>Agricultural Science, Training and Consulting IT Centre</td><td>Science Commercialisation Centre (LUA, LVA)</td><td>Animal Breeding Centre</td><td>Centre for Training and Implementation of Innovative Technologies of Veterinary and Animal Science</td></tr>
<tr><td>Territorial integration, common R&D infrastructure</td><td>Network structure (NCP)</td><td colspan="2">Communication and technology Transfer Infrastructure</td></tr>
</table>

Figure 1. Structure of the Nemunas Valley

Description of different centres is given in Annex 1.

The new Valley infrastructure and equipment would be open to business and public entities on the basis of parity principle according to a separate agreement. Having created the Valley separate annual work programmes will be prepared specifying the works to be carried out, the infrastructure and human resources to be user and similar related matters. This work will ensure equal and effective use of the established infrastructure and knowledge between enterprises and public entities of the Valley.

In addition, the inter-institutional agreements will be concluded establishing preferential conditions for the use of R&D infrastructure by research bodies and R&D action plans coordinated with R&D activities carried out by business entities. The Valley infrastructure will also be used in the process of studies of LUA, LVA and KUT.

The infrastructure necessary for the transfer of technology, spin offs, formation closer linkage between science and business, setting up of R&D subdivisions of businesses, and building industrial

absorption capacities to apply scientific know-how and technology will also be created in the Valley.

In observance of conclusions of the expert group of the Centre for Quality Assessment of Studies (CQAS) “Selection of the Highest Level Physical, Biomedical and Technology Science Centres” **the following groups of scientists recognised and very well assessed by CQAS will be integrated into the cluster of the Valley**:

a) Food technology, safety and health:

o Total h-index of 5 key scientists: 24 Σhi5 (R. Venskutonis, S. Petkevičius, D. Leskauskaitė, P. Viškelis, I. Jasutienė);
o 68 scientists;
o 26 articles in frequently cited magazines;
o 19 frequently cited publications;
o 22 species;
o projects worth LTL 7 million;
o Links with industry – UAB Malsena, AB Kraft Foods Lietuva, Kemira Grow How, AB Danisco Sugar, UAB Herbitum Balticum, UAB Baltic Master, UAB Švenčionių vaistažolės, UAB Kosmevita, AB Achema; business generation - UAB Hortiled, UAB Ruvera, and UAB Aconitum.

b) Agro-biotechnology, bioenergy and forestry:

o Total h-index of 5 key scientists: 6 Σhi5 (P. Janulis, A. Sliesaravičius. V. Stanys, C. Bobinas. I. Brazauskienė);
o 64 scientists;
o 30 articles in frequently cited magazines;
o 4 frequently cited publications;
o 26 species;
o projects worth LTL 19 million;
o Links with industry - AB Achema, UAB Mestila, Kesko Agro Lietuva, UAB Agrokoncernas, UAB Litagros chemija, UAB Dotnuvos projektai, UAB Arvi ir Ko, UAB Linas ir viza, AB Klaipėdos energija, Herbitum Balticum, and Kosmevita.

c) Phytotechnology:

o Total h-index of 5 key scientists: 11 Σhi5 (Z. Dabkevičius, I. Pašakinskienė. B. Jankauskas, I. Brazauskienė, V. Ruzgas);
o 30 scientists;
o 4 articles in frequently cited magazines;
o 1 frequently cited publication;
o 16 species;
o projects worth LTL 4 million;

o Links with industry - AB Achema, UAB Litagros chemija, UAB Agrokoncernas, AB Malsena, and UAB Dotnuvos projektai.

d) Plant biotechnology:

o Total h-index of 5 key scientists: 5 Σhi5 (V. Stanys, R. Rugienius, A. Ražanskienė, V. Ruzgas, G. Brazauskas);
o 19 scientists;
o 14 articles in frequently cited magazines;
o 12 frequently cited publications;
o 16 species;
o projects worth LTL 5 million.

These groups of scientists will form two main Competence Centres of the Nemunas Valley combining the existing R&D infrastructure and the infrastructure which is being developed, other research teams for the implementation of joint R&D projects. According to the scheme given in Figure 1 they are:

1) Centre of Competence for Agro-biotechnology, Bioenergy and Forestry;

2) Centre of Competence for Food Technology, Safety and Health.

The Centre of Competence is a scientific research centre uniting scientists and carrying out high-level fundamental and applied scientific studies aimed at satisfying the needs of agriculture, forestry and food sectors of Lithuania. The Centre of Competence for Food Technology, Safety and Health would engaged in R&D works in the area of quality of raw materials of vegetable and animal origin, animal health, food technology, etc. The Centre of Competence for Agro-biotechnology, Bioenergy and Forestry would engage in agricultural genomics, proteomics, biotechnology, biosystem and other studies. These priority areas are interrelated and supplement each other. They are also mentioned in the strategic documents of Lithuania as areas in which the scientists of Lithuania have potential which could be used more effectively. These areas correspond to those identified by the Centre for Quality Assessment of Studies as being the “centres of relatively large critical mass”.

5. Valley development and financing needs

5.1. Creation of the Valley

The Integrated Science, Studies and Business Centre – the Nemunas Valley – will be developed according to the related Agricultural Valley Development Programme and National Complex Programme for Agriculture, which will be implemented concurrently.

1. The Agricultural Valley Development Programme – according to this Programme the territorially integrated common infrastructure of the Valley will be developed in Kaunas (R&D, knowledge and technology transfer, commercialization of research results, and new business set ups). The main activities of this Programme include:

1.1. Establishment of the territorially integrated common-use infrastructure of the Valley, commercialization of scientific achievements and results, and creation of business support system. The need for the common infrastructure of the Valley was identified during the survey involving the largest business entities of the sector and having identified its need in research bodies. Cooperation agreements concluded with the largest business entities will guarantee the use of the common R&D infrastructure of the Valley for the needs of the sector as well as its maintenance and further development.

It is expected that concentration of the scientific potential and close cooperation between academic and business community will enable to start the commercialization of R&D works, the results of which will possibly be implemented in practice. The groups of scientists participating in the activities of the Valley will be encouraged to patent their scientific inventions, and favourable conditions will be created for business spin offs. Consequently, the Joint Centre for Communications and Technology Transfer of the Valley is being created in the cluster of the Valley comprising the following competent parts:

o the Centre for Commercialization, Integration and Communication of Research with a business incubator;

o the Scientific Library of the Valley with database, data repository and IS centres;

o the Animal Science Technology Park (including the Animal Breeding Centre and the Centre for Training and Implementation of Innovative Technologies of Veterinary and Animal Science).

Their functions: provision of the business incubator's services, public services (including identification of ideas of the innovation and technology development projects activities related with protection of industrial property rights and innovation, etc.), implementation of training and entrepreneurship development programmes, business situation analysis, information and publicising. The funding for the establishment of this infrastructure is applied for according to the respective financing programmes of the Ministry of Agriculture, the Ministry of Education and Science and the Ministry of Economy. The preliminary amount is LTL 67 million.

Also, the following common R&D centres studies and science are being developed (in the territories of LUA, LVA and KUT): Bioenergy; Economy and Management of Agro-innovations, Biosystem and Water Engineering, Animal Nutrition and Biotechnology, Animal Health and Quality of Raw Materials of Animal Origin, Agro-ecology and Promotion of Bio-potential of

Plants, Forestry Research, Studies and Development, Centre for Biotechnology of Plants, Agrochemical Research, Innovative Food Technologies (note: some of these centres will have their remote offices, see point 2.1). Required amount of funding is LTL 187.7 million.

For the purpose of establishing the infrastructure specifications of the national level the study would be prepared, the main purpose of which will be to analyse the infrastructure and activities of the centres functioning abroad in order to adapt the best practice of foreign countries for the setting up of the centres in Lithuania.

1.2. Integration and optimisation of activities of the Valley participants. For the beginning of the Valley integration activities, already since the next year the teaching burden of the university scientists will be reduced increasing the teaching workload of the institute scientists. In such a way the scope of R&D activities carried out in universities would be increased and the synergy between science and studies would be promoted. In addition, the development of joint R&D projects, promotion of cooperation and integration through joint research assignments is envisaged.

The Project of merger and territorial integration of LVA and LVA VI is already under way. Upon completion of the planned works, LVA VI will become the core unit of LVA.

By decision and on the initiative of the Ministry of Education and Science and the Government of the Republic of Lithuania the integration of the Valley participants would be as follows:

1. LIA and LIGH plans for the first Valley development stage include the establishment of the Institute of Agrobiology, which will specialise in plant genomics, biotechnology, plant selection, plant pathology, plant nutrition, soil biology and other research. The Institute of Agrobiology will have the territorially integrated infrastructure in Kaunas and remote network infrastructure in Dotnuva and Babtai.

2. The Water Management Institute of LUA and the Institute of Agriculture Engineering of LUA are being transformed into institutes of the University. Having created the required infrastructure the institutes will be integrated reorganising the LUA Faculty of Water and Land Management and the LUA Faculty of Agriculture Engineering. These Institutes will be moved to the territory of LUA, i.e. fully integrated.

3. LVA Institute of Animal Science will be integrated in LVA as the core unit creating the territorially integrated infrastructure and retaining part of the remote infrastructure in Baisogala (setting up a remote unit of LVA).

4. The Lithuanian Forest Research Institute will be integrated with LUA. Having created the required infrastructure the institute will be integrated reorganising the LUA Forest Faculty, creating the territorially integrated infrastructure and retaining part of the remote infrastructure in Girionys (setting up a remote unit of LUA).

5. The Food Institute of KUT will be fully integrated in the Chemical Technology faculty of KUT (which has the Department of Food Technology) (will have the territorially integrated infrastructure).

2. The National Complex Agricultural Programme – according to this Programme the network R&D infrastructure of the agriculture, forest and food sector will be formed, the research and development projects and personnel training will be carried out in the science and studies

institutions participating in the activities of the Nemunas Valley. The main activities of this Programme include:

2.1. Establishment of the network or territorially not integrated R&D infrastructure aimed at meeting the needs of the sector and guaranteeing the implementation of the sectoral chain for carrying out R&D activities to the full extent. The Lithuanian agriculture, forestry and food sector is in favourable situation with the unique infrastructure intended for agricultural R&D activities has bee preserved after the declaration of independence: pomologic gardens, collections of rare plants and animals, phytotronic complexes, laboratories, and complexes of the experimental base. The transfer of this infrastructure to the urban territory is inexpedient and will not generate any economic benefits. As the results of studies must be based on analyses and development, this infrastructure is necessary and must be further developed.

In this case the network R&D infrastructure is necessary in Babtai, Dotnuva, Baisogala and Girionys (LIGH, LIA, LVA IAS, LFRI), the territorial integration of which is economically ineffective and inexpedient, but this infrastructure is related with the territorially integrated infrastructure of the Valley which is being developed in Kaunas.

Network R&D centres to be developed include: Science and Studies Centre for Agro-ecology and Promotion of Bio-potential of Plants, Centre for Biotechnology of Plants and Agrochemical Research Centre. Also, a remote unit of LUA will be set up in Girionys (Forestry Research, Studies and Development Centre), a remote unit of LVA in Baisogala (Centre for Animal Nutrition and Biotechnology), and a remote unit of the Innovative Food Technology Centre in Babtai. Funds necessary for the establishment of this infrastructure amount to LTL 112.12 million.

2.2. Preparation of R&D activities' financing programmes. Establishment of the national infrastructure, mobilisation of activities of institutions and active participation of the business sector in the activities of the Valley will guarantee the growth of R&D activities. These activities will be co-financed from orders of business entities, participation in the international projects and from national research programmes implemented by the Science Council of Lithuania "Ecosystems of Lithuania: climatic change and human impact", "Sustainable energy". However, this financing will be insufficient for guaranteeing efficient functioning of the Valley. The founders of the Valley will prepare two programmes or a grant scheme for the financing of scientific research by way of tender in the following areas: a) agro-biotechnology, bioenergy and forestry; b) food technology, safety and health. Preliminary amount of funds required for such programme is LTL 165.68 million (LTL 33,136 million per year), and by activity areas: agro-biotechnology, bioenergy and forestry – LTL 88.68 million; and food technology, safety and health – LTL 65.12 million (proceeds of the European Social Fund).

2.3. Development of the infrastructure of studies and programmes, access to databases.
For the purpose of strengthening the synergy between science and studies a new programme will be created (bioenergy) and the existing programmes will be further developed (one of the main features – organisation of practices for students in business entities – founders of the Valley). Financing required for the infrastructure of studies amounts to LTL 30 million, and for the creation of study programmes and implementation of new forms of learning – LTL 33.78 million.

Creation of full-fledged databases and obtaining access to highly qualified foreign databases is of particular importance. Also, continuous financing is necessary for maintaining the database access. The required amount of financing is LTL 15 million.

In implementing Common Agricultural and Rural Development Policy of the EU, the Lithuanian sector of agriculture and its infrastructure are undergoing essential structural changes, modernisation of technology and introduction of innovative economic activities (in particular of bioenergy). These processes are of innovation type and to guarantee their success not only R&D, but also competent university specialists of all levels are necessary. The tendencies of economic development show that the demand for these specialists will not cease.

Having established the integrated science, studies and business centre of agriculture, forestry and food sector – the Nemunas Valley – will be followed by active participation in the international activities – exchanging knowledge, sharing best practices of other countries and using acquired knowledge for the improvement of activities of the Valley. These measures are aimed at continuous improvement of the functioning of the Valley and its adaptation to rapidly changing environment. Joining the International Association of Science Parks is also on agenda.

5.2. Private and public funds and attracting foreign investments

The Nemunas Valley will be financed from several sources:

o *Public investments, financial aid from the EU Structural Funds* (2007–2013) in observance of the Rules for the Grant of Community Financial Aid for 2007–2013 of the Republic of Lithuania Ministry of Education and Science, Ministry of Economy, Ministry of Agriculture and other authorities.

o *Contribution and obligations of private Valley development partners*. Enterprises of the Valley – the Founders – envisage close cooperation in the establishment of the Valley according to cooperation agreements, carrying out scientific research in the areas of activity of the Valley, and training highly qualified specialists (internships in enterprises, etc.). For the purpose of joint activities it is envisaged to prepare the annual work programme for which the enterprise will allocate the designated amount of funds. Cooperation agreements containing obligations of the parties are included in Annexes. Private business entities are also intending to contribute to the Valley in assets. On the basis of R&D works in future enterprises are going to implement pilot projects. Obligations of private partners of the Valley will be discussed in other parts of the Vision.

o *Attracting foreign investments*. In addition to Lithuanian enterprises, foreign firms are also involved in the establishment of the Valley – Agrochema Eesti OU (Estonia), SIA Agrochema Latvia (Latvia), Agrobaltic GmbH (Germany), Sp.z.o.o. Liteximp Prostki (Poland) represented by the Concern UAB koncernas Achemos grupė. At present the need for future works and intensity of cooperation are not yet fully defined. These aspects will depend upon the development level of the Valley, accumulated research potential and agreement of partners in the course of implementation of the Valley Programme. Participation of enterprises of the Lithuanian capital operating abroad in the activities of the Valley would be the first step in attracting foreign investors.

Cooperation is also envisaged with foreign science and studies institutions as well as science and technology parks jointly implementing R&D projects, creating and improving technologies and innovative products. These measures would introduce the opportunities of the Nemunas Valley to potential foreign investors and attract private foreign investments.

o *Other funds*. They include: funds of science and studies institutions participating in the Valley obtained from its activities, outsourced R&D works, implementation of the international R&D programmes, etc.; R&D Programme for Agriculture, Food Sector and Rural Development for 2007–

2013 approved by Order No. 3D-328 of 10 July 2007 of the Minister of Agriculture of the Republic of Lithuania ("Valstybės žinios" (Official Gazette), 2007, No. 83-3403).

Preliminary financing need is specified in Table 2.

Table 2. Financing required for the establishment of the infrastructure of the Valley

Institution	Structural unit of the Valley (name)	Required financing, LTL million
Common infrastructure of the Valley		
LUA common use	Communication and Technology Transfer Centre of the Valley (adjacent to the existing universal arena of STP used for the demonstration of technological achievements, technology transfer and continuous training)	30.0 (60% MoE)
LUA, LVA common use	Scientific Library of the Valley with its Database, data repository and ISC	22.0
LVA common use	Animal Science Technology Park, Animal Breeding Centre and Centre for Training and Implementation of Innovative Technologies of Veterinary and Animal Science	15 (60 % MoE, MoA)
Territorially integrated common R&D infrastructure		
LUA	Building of laboratories of the Valley (for the establishment of laboratories of the Centres of Bioenergy, Biosystsems and Water Engineering, Agro-ecology and Promotion of Bio-potential of Plants)	14.0
LUA	Bioenergy Research and Studies Centre	16.0
LUA, LUA IAE, LUA LUA	Biosystem and Water Engineering Research and Studies Centre	462
LUA	Centre for Agro-innovation Economy and Management	5.0
LUA	Centre for Science and Studies in Agro-ecology and Promotion of Bio-potential of Plants	24.5
LUA	Forestry Research, Studies and Development Centre	16.0
LVA	Centre for Animal Nutrition and Biotechnology	26.0
LVA	Centre for Quality of Animal Health and Raw Materials of Animal Origin	26.0
LVA, LVA VI	Centre for Animal Selection, Genomics and Bioinformatics	14 (33% – VIP)
KUT, KUT FI, LSDI	Innovative Food Technology Centre	33.1
Network R&D infrastructure of the Valley		
LSDI, LIA	Centre for Science and Studies in Agro-ecology and Promotion of Bio-potential of Plants	37.5
LSDI, LIA	Centre for Biotechnology of Plants	28.72
LIA	Agrochemical Research Centre	13
LUA, LFRI	Remote unit of LUA: Forestry Research, Studies and Development Centre	17.3
LVA, LVA IAS	Remote unit of LVA: Centre for Animal Nutrition and Biotechnology	15.6
Other Valley development measures		
LUA	Modernisation of the infrastructure of studies	26
LVA	Modernisation of the infrastructure of studies	4
	Total:	429.92

The total amount of financing necessary for the establishment and development of the Nemunas Valley infrastructure and upgrading of the required equipment is LTL 429.92 million. In addition to the funds necessary for the establishment of the Valley infrastructure, there is also the need for additional investments for the review and improvement of study programmes (LTL 33.78 million,

ESF[4] proceeds), for public R&D activities (LTL 165.68, ESF assistance), and for database access (LTL 15 million, ESF funds).

Table 3. Distribution of financing required for the Nemunas Valley

National programme	Measure	Amount of required financing, LTL million
Agricultural Valley Development Programme/ ERPF[5]	Establishment of the common use R&D infrastructure	200.5
NCP / ESF	Renovation and establishment of the infrastructure of R&D centres, acquisition of equipment	165.68
NCP / ERDF	Research and development projects of R&D centres	172.42
NCP / ERDF	Development of the infrastructure of studies	30
NCP / ESF	Improvement of study programmes	33.78
NCP / ESF	Database access maintenance	15
MoA TP MoE / ERDF	Science and technology park, business incubator, technology creation and transfer	27
	Total:	644.38

NCP – National Complex Programme for Agriculture
MoE – Innovation and Competitiveness Programme of the Ministry of Economy
AFRP – Agriculture, Food Sector and Rural Development R&D Programme for 2007–2013

These investments (both, in the infrastructure and R&D projects) are linked with the main Valley development and breakthrough trends – agro-biotechnology, bioenergy and forestry and food technology, safety and health.

Valley development stages. Given the priority need to create the Valley attraction centre (cluster), the Valley will be formed in two stages:

o *Stage I – Formation of the cluster of the Valley and implementation of the initial R&D projects (2009–2011)*. During this Stage the main common and R&D infrastructure of the Valley will be formed (a new, modern infrastructure of science and technology concentrated in one place and guaranteeing open access to research equipment for all research bodies and business entities) necessary for the implementation of the envisaged priority trends of R&D. The Centre for Communications and commercialisation of research with a business incubator will be established as well as the scientific library of the Valley with database, data repository and ISC, the Animal Science Technology Park, the Animal Breeding Centre and the Centre for Training and Implementation of Innovative Technologies of Veterinary and Animal Science and the planned R&D infrastructure:

o Investments in the common infrastructure for technology transfer, commercialisation and business incubation, and establishment of R&D infrastructure – LTL 252 million (ERDF; of which: from the Ministry of Education and Science – LTL 225 million, and from the Ministry of Agriculture – LTL 27 million);

o Implementation of the initial R&D projects – LTL 82.84 million (ESF).

Total financing required for the completion of Stage I – LTL 334.84 million (2009–2011).

[4] European Social Fund.
[5] European regional development Fund

o *Stage II – Supplementing the cluster of the Valley, extension and integration of studies, further implementation of R&D projects (2011–2013).* This Stage will involve supplementing the established infrastructure of the cluster of the Valley, development of the integration of the groups of scholars and studies, continuation of the existing and starting of new R&D projects:

o Supplementing the infrastructure of the Valley – LTL 177.9 million (ERDF, Ministry of Education and Science);

o Other Valley development measures (data access, etc.) – LTL 48.78 million (ESF);

o R&D projects – LTL 82.84 million (ESF).

Total financing required for the completion of Stage II – LTL 309.22 million (2011–2013).

6. Participation of business in the activities of the Valley and obligations

One of the goals of activities of the Valley is promotion of synergy between academic and business community. In addition to the institutions of science and studies, representatives of business community are also involved in the activities of the Valley. The Valley is being established by institutions of science and studies in concert with the Concern UAB koncernas Achemos grupė, UAB Arvi ir ko, AB Kauno grūdai, the Lithuanian Biofuel Producers and Suppliers Association LITBIOMA, AB Utenos mėsa, the Lithuanian Association of Land Reclamation Enterprises, and UAB Vakarų medienos grupė, who in their turn represent several tenths of businesses (see descriptions of enterprises and enclosed cooperation agreements), business associations (see Annexes). Consequently, not only scholars, but also business representatives participate in the management of the Valley, who will help the representatives from research and studies institutions to get better understanding of priorities of the Lithuanian economy and focus applied research towards the most perspective directions.

The setting up of the Valley is aimed at ensuring measures for the continuous, rather than fragmented formation of synergy of business and science. In view of the above, the goals will be as follows:

1. *To harmonise research infrastructure of science and studies institutions and business entities*:

o develop and set up specialised laboratories in the territory of the Valley directly focused on R&D subjects relevant for business and declared in the agreements concluded with the Valley Founders;

o begin the establishment of the laboratory branch network functioning at the largest business entities for the purpose of merging R&D units with universities initiating joint activities of the academic and business community following the best example of the European universities and bodies;

o develop and establish specialised laboratories the territory of the Valley, directly focused on works outsourced by business;

o adapt the existing business R&D infrastructure to the needs of studies and R&D works carried out by scientists.

Cooperation agreements signed with businesses supporting the establishment of the Valley and intending to participate in its activities provide for the particular obligations of the participants in developing the activities of the Nemunas Valley. The Table below summarises the participants' obligations.

Table 4. Obligations of business entities

Area	Obligations of the Valley participants – institutions of science and studies	Obligations of the Valley participants – business entities
Health of birds, microclimate of microclimate of poultry-houses, feed for birds and poultry, turkey meat production technologies.	To allocate minimum LTL 2 million for investments in the establishment of R&D infrastructure necessary for research of this area and minimum LTL 2 million – for specialist training and related activities.	UAB Arvi ir Ko: to contribute up to LTL 450,000 and grant access to the available assets of LTL 67.7 million total value.
Processing of animal raw material, sanitary, hygiene	To allocate LTL 1.2 million for research of this area, creation of R&D infrastructure and	*UAB Utenos mėsa* (representing Biovela group): to contribute up to

and quality of food products, tests of physical and chemical qualities	specialist training.	LTL 100,000, and grant access to the available base (LTL 20 million), acquisition of assets for implementation (LTL 5 million), fitting out of premises necessary for student internship.
Analyses of feeds, animal nutrition, health, eggs and meat, processing technologies.	To allocate LTL 1.4 million for research of this area, creation of R&D infrastructure and specialist training.	*AB Kauno grūdai*: to contribute up to LTL 100,000, grant access to the available industrial base according to the pre-agreed schedule, participate in the formation of practical skills of students of all levels.
Bio-diesel fuel, bio motor fuel of the second generation, bioethanol, biobuthanol, liquid and compound fertilisers, impact of microelements, soil improvers.	To set up the Centre for Economy and Management of Agro-innovations within the framework of the Valley, train high qualification specialists in the areas of agronomy, management, generation of biomass and bio motor fuel, carry out respective research and create the required R&D infrastructure. Financing envisaged for these works amounts to LTL 12 million.	UAB Arvi ir Ko: undertakes to take part in the training of highly qualified specialists (formation of practical skills), setting up scientific centres and performing research and development works of this area. For the purpose of these works the enterprise will contribute up to LTL 910,000 and will grant access to bio-diesel fuel and other facilities (on the basis of separate agreement).
Bioenergy: biomass, biogas, bio motor fuel, bio-oils	To set up the Centre for Bioenergy, industrial biotechnology laboratories, upgrade laboratories carrying out bio motor fuel and bio gas production technology and quality tests, synthesis of bio-oils, physical, chemical and tribological tests, train highly qualified bioenergy specialists, conduct respective research and create the required R&D infrastructure. Financing envisaged for these works amounts up to LTL 16 million.	*UAB Bionovus, UAB Baloša, Association of Biofuels Producers and Suppliers of Lithuania*: to participate in the training of highly qualified specialists, carry out R&D works of this area, provide access to the available information bank. The amount to be allocated is up to LTL 200,000, also envisaging granting access to the assets of these companies of LTL 12 million total value.
Water sector buildings, permanency and stability tests of hydrotechnical structures	To train highly qualified specialists of this area, conduct respective research and create the required R&D infrastructure (laboratory of construction materials and structures, training laboratories). Financing envisaged for these works amounts up to LTL 10 million.	*Lithuanian Association of Land Reclamation Enterprises*: to cooperate in training specialists of hydrotechnical and water sector structures, organise internships, perform respective R&D works. The Association and its members are planning to contribute up to LTL 300,000.
Biomass, bioethanol, bio-diesel (upgrading of production technologies), bio-diesel of second generation, renewable energy sources for generation of electricity, innovative organic fertilisers, complex and sustainable use of inland waters.	To train highly qualified specialists of this area, perform respective R&D works, create the required R&D infrastructure (Centres for Agro-ecology, Bio-potential and Quality of Plants, Biotechnology of Plants, Bioenergy, Biosystem and Environmental Engineering, etc.), grant access to laboratories according to the principle of parity (on the basis of separate agreement), initiate mobile and stationary laboratories for recording meteorological and soil parameters. Financing envisaged for these works amounts up to LTL 20 million.	*Concern UAB koncernas Achemos grupė*: to take part in the training of highly qualified specialists, carry out R&D works of this area, to participate in creating respective R&D infrastructure and grant asses to the available base (on the basis of separate agreement). It is envisaged to allocate up to 10% from the amount of agreed general annual work programme. On the basis of planned works the Concern is going to implement the innovation development and implementation projects of LTL 1,109.5 million total value.

Agro-forestry, plantation forestry, IS development in forestry, biological diversity of forest ecosystems, wood processing technologies, etc.	To train highly qualified specialists of this area, perform respective R&D works; create the required R&D infrastructure (Forestry Research, Studies and Development Centre, laboratories). Financing envisaged for these works amounts up to LTL 17 million.	*UAB Vakarų medienos grupė, UAB Euromediena*: to cooperate in training highly qualified specialists, participate in and R&D works (on the basis of separate agreements), granting access to the assets of these companies (on agreement basis), invest in technologies and laboratory of genetic and biotechnology tests of hybrid asps. It is envisaged to allocate up to LTL 5 million.

2. *Coordinate and implement as continuous R&D projects of business entities and scholars*, e.g., R&D financed by the Ministry of Education and Science should be developed in the same direction with R&D financed by the Ministry of Economy. To this end agreements were concluded with largest business entities of Lithuania allocating the largest amounts of their resources for R&D activities. These agreements will guarantee active involvement of representatives of business entities both, in creating the vision of the Valley and in preparing the programmes. It is expected that active participation of the largest representatives of the Lithuanian business in the activities of the Valley will facilitate in attracting other large as well as small and medium-sized business entities.

The present Rules for the Grant of Financial Aid for 2007–2013 drafted by the Ministry of Economy provides for the following aid programmes for business entities related with R&D activities: IntellectLT – programme for the financing of R&D activities carried out in business entities and in concert with public research bodies; IntellectLT+ – programme for the establishment of R&D infrastructure, as well as of R&D infrastructure integrated research bodies; LeaderLT – programme for implementation of innovations in business.

The granting of state aid for the cooperation between science and business would guarantee the process of implementation of innovations, the competitiveness of industry at large and continuous growth of added value created per employed individual. The table below contains a preliminary list of business projects (compiled in consideration of the needs of business entities supporting the Valley establishment initiative):

Table 5. Preliminary projects of business entities

Enterprise	Project	Value, LTL thousand	Implementation date
IntellectLT (R&D projects)			
Concern Achemos grupė	Applied research and development of technological studies and complex equipment of increased concentration compound fertilisers (NPK).	3,500	2008–2009
Concern Achemos grupė	Applied techno-economical analysis and designing of adhesives for wood industry.	2,000	2008–2008
UAB Arvi fertis	Use of natural raw materials and industrial waste for the production of valuable compound fertilisers using energy-saving and environmentally-friendly technologies.	3,000	2008–2013
UAB Arvi fertis	Analyses and tests of production of new forms of fertilisers from traditional and non-traditional raw materials.	3,000	2008–2013
UAB Arvi fertis	Multiple special liquid fertilisers for fields, gardens, berry shrubs and flowers.	3,000	2008–2013
IntellectLT+ (R&D infrastructure projects)			
UAB Vakarų medienos grupė	Establishment of Research Centre for Genetics and Biotechnology of Forest Plants.	8,000	2008–2013

Leader LT (implementation of innovations)			
Concern Achemos grupė	Acquisition and construction works of complex equipment for the manufacturing of increased concentration compound fertilisers (NPK).	13,730	2008–2009
Concern Achemos grupė	Construction of the complex of melamine of up to 60,000 t/m and its compounds.	40,000	2008–2011
Concern Achemos grupė	Development of bioethanol production.	290,000	2008–2013
Concern Achemos grupė	Development of the manufacture of eco- board.	35,000	2008–2013
UAB Bioūkis	Development of the manufacture of straw granules.	2,000	2008–2013
UAB Nematekas	Development of the functional food technology line.	2,000	2008–2013
UAB Ruvera	Creation and implementation of production technologies of food supplements and new pharmaceuticals.	3,000	2008 –2013

To sum up, obligations of the Valley participants – business entities – are as follows:

1. Participate in the training of highly qualifies specialists (bachelors and masters degrees) according to possibilities (internship in enterprises, etc.).

2. Carry out research, development and implementation works, and co-finance R&D projects carried out in the Valley.

3. Where necessary set up private or public research units and laboratories in the territory of the Valley.

4. Carry out R&D projects related with the Valley development trends in enterprises, implement innovations.

5. Maintain active cooperation in developing the Nemunas Valley and participate in its management.

Annual work programmes to be prepared at the beginning of activities of the Valley for the purpose of performance of planned works will identify more precisely the envisaged works and the amount of financing which will be allocated by enterprises. According to the preliminary estimates, business entities are planning to contribute up to 10% of the amount indicated in the annual work programme approved by the parties. At present the enterprises which expressed their interest to participate in the Valley have declared to grant access to their assets of total value exceeding LTL 100 million for the implementation of the Valley development trends.

On the basis of R&D works being carried out in the Valley, the enterprises are planning to carry out future pilot projects of innovations the preliminary value of which exceeds one billion litas. Given the successful functioning of the Nemunas Valley it is expected to attract more enterprises interested in the creation and introduction of innovations.

7. Management of the Valley

The principles of management of the Valley are established in the agreement on joint activities concluded by the partners. The management bodies of the Nemunas Valley are the following: the Council of the Valley (hereinafter the Council), the Board of the Valley (hereinafter the Board) and the Board of the Valley (hereinafter the Board).

General supervision of activities of the Valley will be carried out by the Council, consisting of one member nominated by each Partner – Initiator from science and studies institutions and business entities participating in the establishment of the Nemunas Valley: Concern UAB koncernas Achemos grupė, ARVI imonių grupė, AB Kauno grūdai, UAB Utenos mėsa, Association Biofuels Producers and Suppliers of Lithuania LITBIOMA, Lithuanian Association of Land Reclamation Enterprises, Baltic Agribusiness Institute, and UAB Vakarų medienos grupė. Functions of the Council of the Valley:

1. to take decisions on the admittance of new partners;

2. to approve the Valley Development Vision and strategic plans/programmes related with the implementation of the Vision;

3. to approve the amount of the contribution;

4. to assess draft strategic plans/programmes submitted by the Board Chairman, approve strategic plans/programmes, assess and approve reports on the implementation of strategic plans/programmes, findings and proposals with regard to the activities of excellence/competence centres;

5. to assess the effectiveness of activities of science and studies institutions carried out by the Valley and conformity of such activities to the needs of the State and Valley participants;

6. to guarantee proper execution of joint activities and perform other activities provided for in the agreement on joint activities (see Annexes).

The Board shall be formed from representatives of universities, research institutes and business community. Functions of the Board of the Valley:

1) to carry out the general supervision of activities and functioning of the Valley, distribute income generated from joint activity, control the compatibility and consistency of joint activities and report to the Council;

2) to plan the trends of strategic activities and priority areas of work, establish stages/deadlines for the completion of activities/works;

3) to provide proposals to the Council on the development and use of the general infrastructure of the Valley, perform other activities provided for in the agreement on joint activities (see Annexes).

The Board shall draft agreements for the purpose of applying for aid from the EU Structural Funds or other sources of financing and submit them to the Council, handle and administer available

monetary funds and perform other actions on instruction of the Board and provided for in the agreement on joint activities.

Meetings of the Council of the Valley will be held once in 6 months. Representatives of business associations supporting the establishment of the Valley will be invited to these meetings. In such a way the development of the Valley and full-fledged participation of business entities will be guaranteed. The possibility to form sectoral working groups for the development of the main R&D programmes of the Valley development trends. Such management structure is planned for the period of establishment of the Valley and the initial development of the infrastructure.

When the Valley starts successfully operating and long-term relationships with business entities are established, it would be possible to set up the Operator of the Valley – a public institution (e.g., Nemunas) (financed from contributions of active Valley Founders/participants). Public administration bodies and municipalities might also be the stakeholders of this public institution.

8. Activity trends of the valley and cooperation

8.1. Activity trends

Development trends of the Nemunas Valley and joint R&D of the institutions participating in the activities of the Valley:

o agro-biotechnology, bioenergy and forestry;

o food technology, safety and health.

Participants of the Nemunas Valley (representatives of academic and business community) will create and implement innovations and upgraded technologies according to the aforementioned R&D trends in respective agriculture, forestry and food sectors, i.e. where the workforce is concentrated and considerable part of GDP of Lithuania is created. The focus will be on the creation of innovations conducive to higher efficiency and added value.

At present the breakthrough could be identified in two areas – ***biomass and food****.*

The most perspective trends of technological development are as follows:

o creation of safe and competitive plant and animal production and keeping technologies;

o plant and animal genetics, biotechnology and selection;

o food quality and safety assurance, design of new technologies and products;

o biomass for energy and renewable energy resources, sustainable environment.

8.2. Establishment of the system of commercialisation of research results and technology transfer

Thanks to the concentration of scientific potential and close cooperation between academic and business community it is expected to develop R&D works the results of which could be introduced in practice. Therefore, groups of scholars participating in the activities of the Valley will be encouraged to patent their scientific inventions and conditions favourable for the spin offs will be created.

To this end the required infrastructure will be created in the Valley: the Centre for Communication and Technology Transfer with a business incubator, the scientific library of the Valley with its database, data repository and ISC, the Animal Science Technology Park, the Animal Breeding Centre and the Centre for Training and Implementation of Innovative Technologies of Veterinary and Animal Science will be set up. Their functions will be as follows:

1. to create preconditions for simplified commercialisation of inventions;

2. to render public services necessary for the development of knowledge intensive business and introduction of innovations in business, including identification of the innovation and technology

development project ideas, other activities related with technology transfer and protection of industrial property rights and innovations;

3. to prepare the entrepreneurship development programmes, etc.;

4. to provide services of business incubators to the incubated enterprises, in particular spin offs;

5. to organise training courses for participants and employees of science and technology parks, etc.;

6. to carry out the analysis of business situation (regional business situation research, surveys, monitoring related with the provision of public services to business, etc.), manage innovations (search for and presentation of innovations);

7. to communicate to the public the information about activities of science and technology park of the Valley organising awareness-raising and promotional events (seminars, conferences, etc.), creating information databases, websites, cooperation networks, discussion forums, etc. attracting thereby new businesses to the Valley and to the science and technology park.

It is envisaged to set up a business incubator within the framework of the Valley the purpose of which will be to:

o create environment accelerating new business set ups and development;

o support the spin-offs from subdivisions of science and studies institutions, groups of researchers, etc.;

o support technology transfer from public to private sector;

o develop entrepreneurship.

The business incubator will have premises for the settlement of new business start-ups, and will be provided with multifunctional premises (for training, seminars, conferences, etc.) and required administrative premises. The premises will have mobile partitioning enabling to change their layout as necessary. The incubator is going to provide a wide range and high quality services for business start-ups.

All forms of cooperation between academic and business community and planned measures covered by this Development Vision of the Nemunas Valley – ***common R&D infrastructure, joint R&D projects, annual work programmes, participation in the training of high qualification specialists, establishment of business research units, creation of business support infrastructure – experimental base, business incubator, provision of services to incubated enterprises, support to new business set ups, implementation of enterprise development and other training programmes, etc.*** *– will be applied in the Valley with a view to*:

1. attracting researchers to business;

2. building industrial absorption potential;

3. increasing competences related with the implementation of innovations;

4. introducing technology transfer mechanisms;

5. developing entrepreneurship culture;

6. setting up testing laboratories in enterprises;

7. commercialising research results.

9. Social–economic implications, added value of planned investments, impact on the competitiveness of economy and sustainable social development

The sectoral integrated science and studies centre of agriculture, forestry and food sector – the Nemunas Valley will be set up. The Valley will be perceived as the key science and studies centre of agriculture, forestry and food sector in Lithuania. The Vision of the Valley is merging the existing business research units with laboratories of universities and institutes. In the opinion of the Founders of the Valley, such model of activities is likely to stimulate the establishment of full-fledged, rather than fragmented linkages between business and academic community. At present the largest expended for research bodies and R&D activities are declared by largest business entities of Lithuania. Their involvement in the activities of the Valley was predetermined by examples of cooperation practice between the most outstanding universities, institutes and business community of Europe and other regions of the world.

It is expected that completion of the first stage of development of the Valley will be followed by creation of the network of laboratories–affiliates or mobile laboratories and their employed researchers and activities thereof will be jointly financed by research and business entities. To this end vertically integrated joint R&D plans will be compiled. After full implementation of the Valley establishment and development plans, joint research plans of academic and business community would be prepared – the so-called higher added value generation chains (see example in Annex No. 5) oriented towards manufacture of products generating medium-high or high added value in the largest enterprises of Lithuania related with agriculture, forestry and food sector.

If the Initiators of the Valley succeed in developing at least several chains of development of higher added value products until end-product, it would be possible to recognise such process as completed and successful, because largest enterprises of Lithuania will be capable to compete in the area of innovative products with foreign enterprises and their good example will directly stimulate other business entities to participate in R&D activities of the Valley. Successful implementation of the first Valley development agreements will secure ambitions to become the largest and most competitive R&D cluster in Lithuania.

Planned *social and economic implications* of the Nemunas Valley will have positive influence for several directions – system of science and studies, agriculture, forestry and food sector and related activity spheres, rural development, general competitiveness of Lithuania's economy and for securing social and economic development:

o The public base agriculture, forestry and food sector of will be strengthened in the system of science and studies of Lithuania. This would guarantee the long-term systematic development of science and technology facilitating establishment of R&D&I based economy. The effectiveness of R&D activities of the system of science and studies and its consistency with economic needs of the country would be enhanced. More residents of Lithuania would be able to acquire high qualifications satisfying labour market needs.

o Consistent R&D system for the development of agriculture, food sector and rural areas coordinated with agriculture, food sector and rural development policy would be created and implemented, enabling to ensure sound use of natural resources and ecologic balance. Agricultural output would be of high quality. Consequently, the competitiveness of agricultural and food products in local and foreign markets and income of farmers and agricultural producers will grow. Also, the development of bioenergy will be intensified and help in reducing dependence upon imported oil, negative impact on climate and contribute to more effective use of the available resources of agriculture and food sector. Concurrently, the employment level of rural residents will grow, Lithuanian regional development disparities will and social exclusion of rural areas will be reduced.

o Also, the scientific and technological potential of the country sill be enhanced. More active involvement of business representatives in R&D and closer cooperation between business and science and studies institutions and competence networks would be encouraged. Development of innovation culture in business would be stimulated and innovation capacities of enterprises would be enhanced followed by increasing numbers of competitive products and services generating higher added value. In view of the above, activities carried out by the Nemunas Valley would contribute to the development of modern, dynamic and competitive economy as well as sustainable economic and social activities in Lithuania at large. The main social–economic indicators the growth of which will depend upon activities of the Nemunas Valley (in 10 years of trhe start of activities of the Valley):

* larger numbers of individuals with university education in rural areas – 20% during the aforementioned period;

* increase of income earned by agricultural producers – 50% during the aforementioned period;

* growth export of food products – about 10% annually;

* implementation of new and upgraded medium-high technologies in this sector – about 300 million annual investments;

* new jobs created for highly qualified employees – about 300 per year.

List of Annexes