


Research and technology development strategy
Latvian – Lithuanian border region has been developed within the framework of the Latvia-Lithuania crossborder cooperation programme project 2007 to 2013 „Fostering Capacity for Business Development in Latgale-Utena Cross Border Region”, NoLLII-119

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Research and technology development strategy in Latvia-Lithuania cross border region

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Terms and abbreviations

Cross-border region – area which includes Latgale region in Latvia and Lithuanian border region Zarasai, Ignalinas regions and Visaginas city

| | | |
|-----|---|--------------------------|
| DU | – | Daugavpils University |
| EC | – | European Commission |
| EU | – | Europe Union |
| GDP | – | gross domestic product |
| IT | – | Information Technologies |
| km | – | kilometer |

Lithuanian border region – area which includes Zarasai and Ignalinas regions and Visaginas city

| | | |
|-------|---|---|
| LR | – | Republic of Latvia |
| LT | – | Lithuania |
| LV | – | Latvia |
| ME | – | Latvian republic Ministry of Economy |
| MEPRD | – | Ministry of Environment Protection and Regional Development of the Republic of Latvia |
| MES | – | Ministry of Education and Science of the Republic of Latvia |
| NGO | – | nongovernmental organisation |
| R&D | – | Research and Development |
| RHEI | – | Rezekne University |
| RSEZ | – | Rezekne Special Economic Zone |
| RTU | – | Riga Technical University |
| SME | – | Small and Medium-sized enterprise |
| USA | – | United States of America |

1. Methodology

Research and technology development strategy in Latvia and Lithuania border region was developed for the territory of Latgale region and Lithuania border region, which is formed by Zarasai, Ignalina regions and Visagina city. In some cases when data on certain Lithuania border regions were not available, these were substituted by data on Utena region. Considering the situation of Lithuania border region in the field of educational, research and technological enterprises, the activities included in the recommendations and the action plan are applicable to the whole Utena region.

Analysis of the secondary data was the primary action undertaken for the purpose of analyzing the current situation, required for the development of the strategy. The previous studies in the fields related to business and innovation development were assessed. The planning and strategic documents were analyzed to study the situation in Latvia and Lithuania at national, regional and local level – the national development strategies, innovation and research strategies, regional and urban development plans. Second, analysis of statistical data was performed, using the data of the Central Statistical Bureau of the Republic of Latvia and the data of the Central Department of Statistics of the Republic of Lithuania, as well as analyzing the data from the data bases of educational institutions and the information provided by the project partners. Third, the potential innovative companies were identified and selective interviews were conducted on site and by phone. For the purpose of creating a representative sample, the companies were ranged by their operational sectors and the information available on the measures implemented to introduce new products and Technologies. A sampling of 55 companies was created. 24 companies in Latgale and Utena were surveyed by phone and interviews with 8 companies were conducted on site. Some companies were reluctant to provide answers to all questions or they did not have an opinion on the matter. In total phone calls were made to 38 companies in Latgale and 7 companies in Utena region. Those companies that did not respond immediately to the phone call or asked to call later were called 3-4 times on average. The average duration of the interview was approximately 20 minutes. Several representatives of the companies provided incomplete answers to the questions – they lacked an opinion on specific questions or did not have time to continue the conversation. 24 of the companies did not wish to respond to the questions at all or did not respond to the phone calls. All of the companies surveyed on site provided answers to all questions of the interview. In addition three interviews were conducted with representatives of scientific institutions.

For the purpose of analyzing the EU and global trends, analysis of the secondary data and analysis of the qualitative information were performed by analyzing the legal norms and policy documents of EU, as well as cases of innovation strategies of certain countries – Estonia, Finland and Sweden and the best practice at national and regional level. The current studies in the fields related to business and innovation development were analyzed as well.

The expert opinions were summarized for the purpose of developing the strategy, based on the results of the analysis of the current situation and the results of the analysis of the EU and global trends. For the purpose of involving target groups of Latgale region in the strategy development process, a co-creation event was organized according to the method of idejuTalka, in which 26 participants took part representing the state and municipal institutions, Latgale region, business support structures and educational institutions. IdejuTalka is a co-creation and collective intelligence approach which allows taking complete use of the knowledge, ideas and intuition of the participants to address some very important issue or task. In contrast to other methods it is focused on a more efficient use of the cooperation and co-creation mechanics of a large participant group. It enables the participants to create an intellectual product - development plan, strategy, concept of new products, knowledge maps and feasible projects - quickly and efficiently. During the four hour event important development trends, which will be used to derive material courses and goals of action, were assessed and the most significant resources of the region were identified. A foundation was laid for taking activities to encourage development of the innovations and technologies in the region. Due to the limited number of potential participants in Utena region the idejuTalka event was substituted by a focus group comprised of representatives from the regional administrations, municipalities, Utena business information centre, and a regional representative of the Lithuanian innovation centre. During a discussion the focus group assessed the current situation in the border region and the development potential and analyzed the goals and action courses of the strategy. In addition to the development of the strategy the participants of the idejuTalka and the focus group also provided qualitative information for the analysis of the current situation. The preliminary version of the strategy was forwarded for public discussion to the stakeholders of the border region - participants of the idejuTalka and the focus group, educational and research institutions, municipalities, regional representatives, entrepreneurs and representatives from the business support structures. The comments received were analyzed and included in the final version of the strategy.

The experts of SIA „Baltijas Konsultācijas” Artūrs Kokins, Gatis Liepiņš, Karīna Meža-Eriņa, Mārtiņš Lasmanis, Sandris Mūriņš, Sanita Kovaļeva and the expert of idejuTalka Mārcis Rubenis participated in the development of the strategy, organization of the events and summarizing of the information.

2. Description of the current situation

Despite the geographical proximity, the educational, business and research environment and structure of Latgale region and Utena region are different. It can be explained both by the size of the cities in both regions and by the population, infrastructure and historical location of the industrial objects which has significantly affected the current situation in the border region.

According to the results of Population census, in 2011 there were less than 305 000 residents in the Latgale statistical region that occupies the area of 14 550 km². Population density in Latgale region is 21 people per km². There are 14 cities in Latgale region, the biggest of which is Daugavpils (93 312 residents) and Rēzekne (32 328 residents)¹.

In the terms of territory and population Utena region is twice as small as Latgale region and is one of the least densely populated regions in Lithuania, and there are 10 cities in the region. The total area of Utena region is 7 201 km², and 152 577 residents were living there at the beginning of 2011; accordingly the population density is similar to that of Latgale - 21 people per km². The area of the Utena region border territory Visagina is 58 km², the area of Ignalina is 1 447 km² and that of Zarasai - 1 334 km² accordingly, and less than 60 000 residents are living in the region, which is less than in the biggest city of Latgale region - Daugavpils. Population density in Lithuania border region is similar to that of Utena region - 21 people per km². The Visagina city has the biggest population in the Lithuania border region - 22 708 residents. Whereas the population of Ignalina and Zarasai is approximately the same - around 18 500 residents².

Although the population density values on both sides of the region border are similar, there are two republican cities in Latgale region - Daugavpils and Rēzekne, which have concentrated a significant share of population and simultaneously also the educational and research institutions and enterprises. These cities serve as the development, educational and cultural centres of Latgale region. There are also several important regions in the Latgale region next to the big cities, the population of which exceeds 10 000 people, with such administrative centres as Balvi, Krāslava, Līvāni, Ludza and Preiļi.

There are mainly small cities located in the Lithuania border region and the nearest biggest city is Utena with less than 32 000 residents. Utena city is the most important educational and development centre of the border region, followed by Visagina which has a high growth potential.

Significant reduction of population is observed in both regions; many people are going to other regions or abroad to look for a job, thus significantly endangering the development possibilities of business due to the lack of labour force.

The best educational opportunities in the border region are offered in Latgale region, where wide range of professional education opportunities is available in 15 professional education

¹ Data of the Central Statistical Bureau of the Republic of Latvia as of the beginning of 2011.

² Data of the Central Department of Statistics of Lithuania as of the beginning of 2011.

institutions, as well as two regional higher education institutions – Daugavpils University, Rēzekne Higher Education Institution and 17 branches of higher education institutions, which enables obtaining education up to the doctor's level. In Lithuania border regions there is only professional education of different disciplines available, offered by 3 education institutions, where higher education can be obtained at the level of bachelor's and master's degrees, those being Utena University of Applied Sciences (Utena College) and Panevezys Institute.

Considering that the development of science and research is closely related to the operation of higher education institutions, the research is mainly concentrated in Daugavpils and Rēzekne. Scientific institutes are operating under the wing of higher education institutions, private scientific institutes are developing, technology transfer offices have been established and business support structures are available in both cities of Latgale region. Innovative microscopy centre has been established in Daugavpils University. Studies in ecology, biology, social and humanitarian sciences, as well as latgalistics, art and culture are carried out in Daugavpils University. Mechatronics laboratory has been created in Rēzekne as a result of cooperation between the higher education institution and Latgale Machinery and Technology centre. Rēzekne Science and Technology Park accommodates a modern centre for production of plastic product prototypes. Besides Rēzekne Higher Education Institution performs research in such fields as environmental science, latgalistics and special pedagogy. There have also been established several private research institutions in the region as the Institute of Physical Research and Biomechanics in Rēzekne and Latgale Agricultural Science Centre in Viļāni. Scientific institutes are participating both in the development of state commissioned research projects and different international cooperation projects, but cooperation with entrepreneurs in development of new products and technologies has not been active so far. The contribution of EU structural fund projects in the development of research infrastructure has been significant.

Scientific and research activities in Lithuania border region are carried out only by two private enterprises located in the Visagina business incubator. The enterprises provide research and testing services in material science and renewable energy resource field.

The most significant city for the development of technology business in the border territory is Daugavpils, which has historically developed as a transit and industrial centre; it has a suitable road and railroad infrastructure and the territories of the former factories. Rēzekne and the other most significant administrative centres serve as the second development centre in Latgale region. In Lithuania the regions of Visagina, Ignalina and Zarasai have established an environment favourable for business development, mainly being oriented towards tourism and developing natural park territories. The development of Lithuania border region has been significantly affected by the operation of Ignalina nuclear power station, and after it was closed, many people left the city or were searching of other means of income, including in business. Land resources for business development are available on both sides of the border, and the municipalities are implementing different support measures.

The border region has traditionally concentrated enterprises operating in medium and low-tech sectors (metal working, mechanical engineering, chemical industry, textile industry, food industry). There are enterprises operating in food industry, metal working, wood working, plastic industry and textile industry on both sides of the border. Enterprises related to environmental and alternative technologies are developing. In terms of business development Latgale region is significantly ahead of Utena region. In 2010 there was 51 economically active individual merchant and enterprise per 1000 people in Latgale region. In total there was 17 031 economically active statistical market sector unit, mainly comprised by micro-enterprises³. In 2010 there were only 2 811 economically active statistical market sector units in Utena region (in 2011 there was accordingly 2 941 unit and in 2012 the number of these units had reduced down to 2 703)⁴. In 2011 there were only 19 economically active statistical market sector units per 1000 people in Utena region. Business establishment in Utena region is hindered by the lack of qualified labour force. Development of new technologies and products usually is performed either internally within the enterprises or by taking these over from the holding companies or adjusting to the needs of the clients. The enterprises cooperate with scientific and research institutions only on irregular basis.

Cooperation between Latgale region and Lithuania border regions has mainly resulted from the implementation of different common projects with involvement of municipalities and regional administrative units. The enterprises and educational units have not been involved in the cross-border cooperation so far, which can be explained by the lack of information on the potential cooperation partners as well as the lack of corresponding cooperation partners.

³ Data of the Central Statistical Bureau of the Republic of Latvia.

⁴ Data of the Central Department of Statistics of Lithuania.

3. Directions and trends of the research and technology development in Latvia-Lithuania border region

The development of research and technology based on innovation is one of the national priorities of both neighbouring countries with the awareness that, considering the profile of both countries, innovations play an important role in the business development and national growth.

At the level of planning documents the research and technology development is stated as one of the priorities both in the Long-term sustainable development strategy of Latvia until 2030, emphasizing the need to support creation and commercialization of new ideas, transfer of knowledge and user-defined research, and in the Development strategy of Lithuania until 2030, defining the need to create a science and research friendly environment and encourage the innovations both in public and business.

In Latvian case innovations adapted to the needs of the users, open innovation practice, innovative business and innovation culture were mentioned as the development courses in the strategy. The importance of research was stressed also in the field of renewable energy resources.⁵ Whereas Lithuania plans to concentrate the science and research funds to create market-oriented innovations, establish innovation centres and encourage innovative education.

The Latvian National Development Plan 2007-2013 envisages the intellectualization of the economy, which includes the investments in both the human resources and the science and research infrastructure. In parallel it also encourages the transfer, development and commercialization of technologies and cooperation of scientific institutions and businesses.

The National Long-Term Development Strategy of Lithuania, which was adopted by the Lithuanian parliament in 2002, foresees the development of the cooperation system of SME and educational and scientific institutions, as well as envisages the possibility for SME to use technologies and qualified human resources.⁶

The National Strategy for the Development of SME of Lithuania identifies the encouragement of innovation and technology development as one of the strategic courses – supporting the national research programs oriented towards knowledge commercialization and technology development.⁷

The National Strategy for Sustainable Development of Lithuania, approved in 2003, also foresees several actions to encourage research for the purpose of ensuring sustainable development. One of the priorities is ensuring practical applicability of the research results to ensure environmentally friendly production. The strategy includes also several activities to ensure research for preservation of biodiversity, development of environmentally friendly

⁵ LR Saeima „Latvijas ilgtspējīgas attīstības stratēģija līdz 2030. Gadam”, 2010

⁶ Marika Rudzīte-Griķe, Ingrida Veipa, Valdis Kudiņš „Uzņēmējdarbības un zinātnes sadarbības perspektīvas”, Daugavpils, 2012

⁷ Marika Rudzīte-Griķe, Ingrida Veipa, Valdis Kudiņš „Uzņēmējdarbības un zinātnes sadarbības perspektīvas”, Daugavpils, 2012

production technologies, promotion of energy efficiency, in the field of renewable resources, in environmentally friendly agriculture and other fields.⁸

Specific strategic and planning documents have been developed for the purpose of developing innovations and research in both countries. In Latvia Program for Promotion of Business Competitiveness and Innovation for 2007-2013 was developed in 2006, and its action courses also include encouragement of research and technology development:

- ❖ to encourage common conduct of business research of higher education and scientific institutions and economic operators;
- ❖ to encourage transfer and commercialization of knowledge;
- ❖ to encourage introduction of innovative solutions in business;⁹

The following have been defined as the priority scientific courses for the period of 2010-2013 at Latvian level in cooperation with the representatives of sector relevant ministries, science and national economy sectors:

- ❖ energy and environment (technologies for production and use of renewable energy resources, technologies for reduction of climate changes and biodiversity);
- ❖ innovative materials and technologies (information sciences, information and signal processing technologies, nanostructured multifunctional materials and nanotechnologies);
- ❖ national identity (language, Latvian history, culture and human security);
- ❖ public health (means and methods of prevention, treatment, diagnostics, biomedical technologies);
- ❖ sustainable use of local resources (mineral deposits, forest, food and transport resources) – new products and technologies.¹⁰

Whereas in Lithuania the Innovation strategy of Lithuania 2010-2020 was approved in 2010, including among other tasks oriented towards encouragement of international cooperation in the field of research, commercialization of research, creation of a mechanism for cooperation between business and science and application of systematic approach to encourage innovation. The strategy is the first document of a similar type in Lithuania and it is oriented towards establishment of a creative community and improvement of the business environment, which is the basis for the development of business and innovations. In the sectoral context the following industrial sectors have been identified in the as competitive industries with high added value: food and potables, wood and its products, furniture, textiles, chemicals, products and fibres. Lithuania has a great potential in biotechnologies, laser technologies, production of electrical and optical appliances. The IT sector and environmentally friendly technologies, future energy, creative industry and health sectors were mentioned as having perspectives.

⁸Government of the Republic of Lithuania „National strategy for sustainable development”, 2003

⁹ LR ME „Komerccdarbības konkurētspējas un inovācijas veicināšanas programma 2007. – 2013.gadam”, 2007

¹⁰LR MES „Zinātne Latvijā”, 2010

At the regional level the Latgale Strategy 2030 emphasized the need to improve the connection between the educational institutions and enterprises, thus establishing the base for innovative activities and development of research and business. Innovations at all levels of business were also mentioned as being important. "Green energy" has been identified as one of the research priorities.¹¹

Whereas the Action plan for the development of Latgale Province in 2012-2013, developed by the Ministry of Environmental Protection and Regional Development, envisages measures for encouragement of business and innovations, including ones to encourage cooperation between the universities and the entrepreneurs.

The Latgale region and city development programs (current editions) also envisage encouragement of innovative business development. For example, the Daugavpils City Development Program 2008-2014. identifies that resources should be concentrated for the development of the economy in Daugavpils and Latgale region to create, support and develop the high-tech sectors in the economy of the city as a significant source of employment, added value, resident income and municipal budget income.¹² The Rēzekne City Integrated Development Program 2007-2013 also identifies introduction of new technologies and innovations in the industrial field as one of the development possibilities of the city, assigning the tasks of introducing innovations and transferring technologies, developing science and research and application of knowledge for the purpose of business competitiveness.¹³

The regional and local level planning documents in Lithuania mainly envisage measures for business development in the border regions, including for the establishment and development of high-tech enterprises. For example, in the Strategic Development Plan of Ignalina Region 2011-2018, which was adopted in 2011, two of the tasks assigned to the Ignalina business information centre are – to encourage new technologies and scientific innovations in business and to encourage innovative economic ideas in the community. Establishment and development of technological parks was emphasized as the possibility of regional development and the encouragement of the development of technological enterprises was included among the strategic tasks.¹⁴ Whereas the Regional Development Plan of Utena area municipality 2012-2014 intends to provide support for the development of innovative and perspective business ideas. The Strategic Development Plan of Utena Region 2011-2017, which was adopted in 2010, also envisages development of modern technologies which could improve the business competitiveness.¹⁵

¹¹ „Latgales stratēģija 2030”, 2010

¹² Daugavpils pilsētas dome „Daugavpils pilsētas attīstības programma „Mana pils Daugavpils 2008 - 2014””, 2008

¹³ Rēzeknes pilsētas dome „Rēzeknes pilsētas integrētās attīstības programma 2007-2013.gadam”, 2007.

¹⁴ Ignalinos rajono savivaldybės administracija „Ignalinos rajono savivaldybės 2011–2018 metų strateginis plėtros planas”, 2011

¹⁵ Utenos rajono savivaldybės administracija „Utenos rajono strateginis plėtros planas iki 2017 m.”, 2010

In addition to the planning documents the research and technology development courses in the border region are identified both by the activities of the scientific and research institutions and the entrepreneur initiative and business support structures.

In Latgale the research institutions are mainly concentrated around the regional universities and the business support structures. Most of the scientific and research institutions are located in Daugavpils and Rēzekne and operating under the Daugavpils University and Rēzekne Higher Education Institution. Considering the specifics of the studies offered by both universities, significant proportion of research is conducted in the disciplines of humanitarian, social and pedagogical sciences. Scientific institutes implement studies within the framework of national research programs. Research is conducted in several issues related to the regional specifics in the fields of linguistics, history and the regional development. In addition to the professional and higher education, research activities are also established in the field of art, which is complemented by the newly created Creative Service Centre of Eastern Latvia. At the same time the universities ensure conduct of studies in such fields significant for the development of technologies as mechatronics, physics, chemistry, biology, alternative energy etc.. One private scientific institution has been established as well, operating in the field of laser physics, energy and optical science. Simultaneously with the scientific activities mechanisms for the capitalization of research results have also been introduced, technology transfer office has been established at Daugavpils University and environment technology transfer office – at Rēzekne Higher Education Institution, as well as the possibilities for production of plastic product prototypes in Rēzekne Science and Technology Park.

In the Lithuanian border region research activities are provided by the Utena College which has introduced a system for adaptation of business studies for the purposes of entrepreneurs. Considering the specifics of the region – the former and the perspective nuclear power station, certain educational and research activities are implemented in the field of nuclear energy. Two private scientific research institutes are operating in Visagina, conducting studies in the field of metal working, as well as designing components for solar batteries.

Despite the numerous research possibilities and courses, research development is facing significant problems mainly related to the involvement of human resources in science. The number of state-paid jobs for the scientists is relatively small. As for the perspective scientists, the students still lack interest for the exact sciences, for example, the Physics program of Daugavpils University is not demanded among the young generation, the state paid places are not even filled out.¹⁶

The other significant problem is the capitalization of the research results. Although positive trends have been gradually observed in the cooperation of the entrepreneurs and the scientific institutions, still a great part of the interviewed potentially innovative enterprises and also scientific institutions admit that cooperation with scientific institutions is virtually non-existent. As the results of the enterprise interviews and the opinions of the idejuTalka

¹⁶Daugavpils pilsētas dome „Daugavpils pilsētas attīstības programma „Mana pils Daugavpils 2008 - 2014””, 2008

participants demonstrate, the community lacks understanding of the research and development per se, as well as of the research services offered by the scientific institutions and the current intellectual property. The enterprises often develop new products and technologies either within the enterprise or within the group of enterprises, transferring the knowledge and technologies from the parent companies. Several enterprises have implemented projects of new product and technology development by using EU co-funding. The entrepreneurs often are not even aware that by changing the production processes or machinery they can achieve patentable product and technology innovations as the end result.

Another significant research and development trend is the use of external funding for the implementation of local and international projects. Projects of the National Research Program are being implemented. By using the funding of EU Structural Funds, the universities and scientific institutions have improved the research infrastructure and introduced mechanisms of research result capitalization and cooperation, as well as have conducted studies on topical subjects. Some scientific institutions are implementing international research projects which are financed from the funds of EU Seventh Framework Program, and different projects which encourage research and are financed from the funds of cross-border cooperation projects and other financial sources. Use of external funding both for the scientific and research infrastructure and the research activities have served as significant pre-conditions for the improvement of the regional research capacity.

In general the border region does not demonstrate significant advantages for the development of science and research on a national scale, which can be explained by the specifics of the research activities that can be ensured in any region. Still it has to be noted that substantial research base has been established in proximity of the Daugavpils University and Rēzekne Higher Education Institution. Several advantages exist in the use of funding; EU project conditions provide certain advantages for the start-up and development of business related to the development of new products and technologies.

4. Analysis of the current situation in Latvia-Lithuania border region

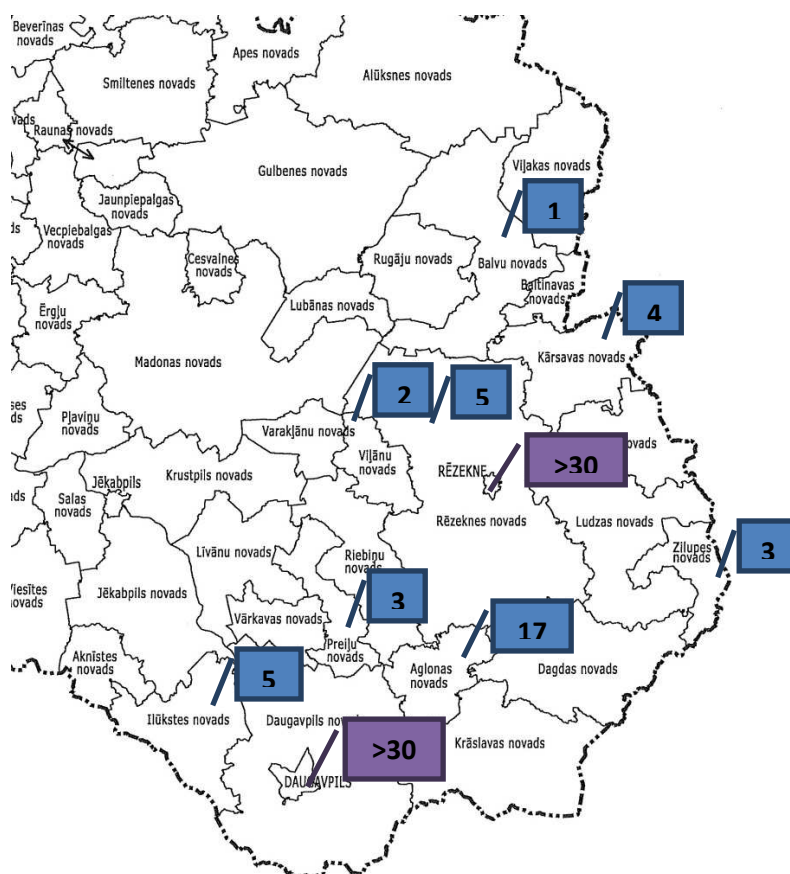
4.1. Availability of knowledge resources in the region

4.1.1. Educational opportunities in Latgale region

Currently two universities are operating in Latgale region – Daugavpils University and Rēzekne University, as well as 15 university branches in Daugavpils, Rēzekne and Balvi region. 15 professional education institutions are operating in Latgale and eight branches thereof in the regions of Latgale, as well as Rēzekne and Daugavpils, which offer possibilities to obtain secondary special education, vocational education, 1st level professional education, bachelor, master and doctor's degree in Latgale region. According to the information of the National Database of Educational Opportunities, education of all above mentioned levels can be obtained in Latgale region.

Secondary professional and vocational education

Around 100 different professions can be obtained in different professional education institutions in Rēzekne, Daugavpils and eight other regions.



Picture No 4.1.1.1. Opportunities of vocational and secondary professional studies in Latgale. Source: National Database of Educational Opportunities.

Picture No 4.1.1.1. displays the number of vocational and secondary professional study programs in each of the Latgale regions, as well as the biggest cities. The table No 4.1.1.1. displays the educational opportunities in the vocational schools and professional high schools in Latgale region. The table shows all educational institutions available in Latgale region and the fields of study offered by these, without classifying by the profession types in detail (for example, programmer and computer specialist are included in one field). Thus the table No 4.1.1.1. displays the study programmes available in Latgale region, as well as the availability of knowledge depending on the number of the educational institutions offering education in the given field.

| Educational institution / Field of study | Daugavpils State Technical school | Daugavpils Building Professional Secondary school | Daugavpils Music Secondary school | Daugavpils Commercial school | Daugavpils Art school „Saules skola” | Professional Secondary school of Eastern Latgale | Rēzekne Art and Design Secondary school | Rēzekne music secondary school named after Janis Ivanovs | Alsviķi Professional Secondary school | Professional Secondary school of Middle Latgale | Branch of Riga State Technical school in Balvi | Bebrene Professional Secondary school | Malnava college |
|---|--|--|--|-------------------------------------|---|---|--|---|--|--|---|--|------------------------|
| Administrative work | X | | | | | X | | | X | | | | |
| Shoe repair | | | | | | | | | X | | | | |
| Mechanical engineering | X | X | | | | X | | | | X | | | X |
| Construction | | X | | | | X | | | X | X | | | |
| Computer sciences/ Programming | X | | | | | X | | | | | | | X |
| Power, electronics, automatics | X | | | | | X | | | | | | | |
| Food production | | | | X | | X | | | X | X | | X | |
| Hairdresser services | X | | | | | | | | | X | | | |
| Wood processing | X | | | | | | | | | X | | X | |
| Commercial sciences, accounting | X | | | | | X | | | | X | X | | X |
| Agricultural professions | | | | | | X | | | | X | | | X |
| Art and design | | | | | X | X | X | | | | | | |
| Metal working | X | | | | | | | | | X | | | |
| Music | | | X | | | | | X | | | | | |
| Heat, gas, water technologies | | X | | | | | | | | | | | |

| Educational institution / Field of study | Daugavpils State Technical school | Daugavpils Building Professional Secondary school | Daugavpils Music Secondary school | Daugavpils Commercial school | Daugavpils Art school „Saules skola” | Professional Secondary school of Eastern Latgale | Rēzekne Art and Design Secondary school | Rēzekne music secondary school named after Janis Ivanovs | Alsviķi Professional Secondary school | Professional Secondary school of Middle Latgale | Branch of Riga State Technical school in Balvi | Bebrene Professional Secondary school | Malnava college |
|---|--|--|--|-------------------------------------|---|---|--|---|--|--|---|--|------------------------|
| Textile industry | X | | | | | | | | X | | | | |
| Operator of text editor | | | | X | | | | | | | | | |
| Commerce | | | | | | X | | | | X | | X | |
| Tourism and recreational service, hotel and restaurant services | | | | | | | | | | | | X | |
| Veterinary medicine | X | | | | | X | | | X | | | | |

Table No 4.1.1.1. Opportunities of professional and vocational education in Latgale region. Source: National Database of Educational Opportunities.

The availability of knowledge, which is demonstrated by the wide range of study programs available in different educational institutions of Latgale region, is greatest in such fields as commercial sciences, accountancy and administrative work, creative industries (including music, art and design study programs), motor transport, as well as catering service field. Study programs of each of the mentioned fields are provided by five different educational institutions. It has to be noted that specific situation is observed concerning the availability of creative industries – almost all study programs of creative fields are provided by the educational institutions of Rēzekne and Daugavpils cities. Certain design related study programs are provided at the regional level as well – by the Professional Secondary school of Easter Latgale and its branches, but basically these programs are more available in the big cities.

Whereas the study programs similar to commercial sciences, included in the field of social sciences, are commerce, tourism and hospitality. Commerce studies can be mastered in one educational institution – Daugavpils Commercial school. Study programs related to tourism and hospitality are provided in three different educational institutions of Latgale region.

The so called technical sciences are quite available in the planning region, for example, the construction related studies can be mastered in four educational institutions of Latgale region both in cities and in regions.

IT studies, including programming and computer science programs, are available in three educational institutions of Latgale region. Similar study program is also the operator of text editor, which is provided by Alsviķi Professional school and is intended for people with disabilities.

Power and electricity industry related studies are provided by two educational institutions. A similar study course – heat, gas and water technologies – is provided only by one educational institution.

Metal working studies are provided by two professional secondary schools, but wood processing programs are more available and can be mastered in three educational institutions.

Agriculture and fishery is a relatively popular study course in Latgale region. Study programs related to these fields are provided by three educational institutions of Latgale region.

Less available study courses at the level of professional and vocational education are – hair dresser services (provided by two educational institutions), tailoring industry (provided by two educational institutions), shoe repair (provided by one educational institution) and veterinary medicine (provided by one educational institution).

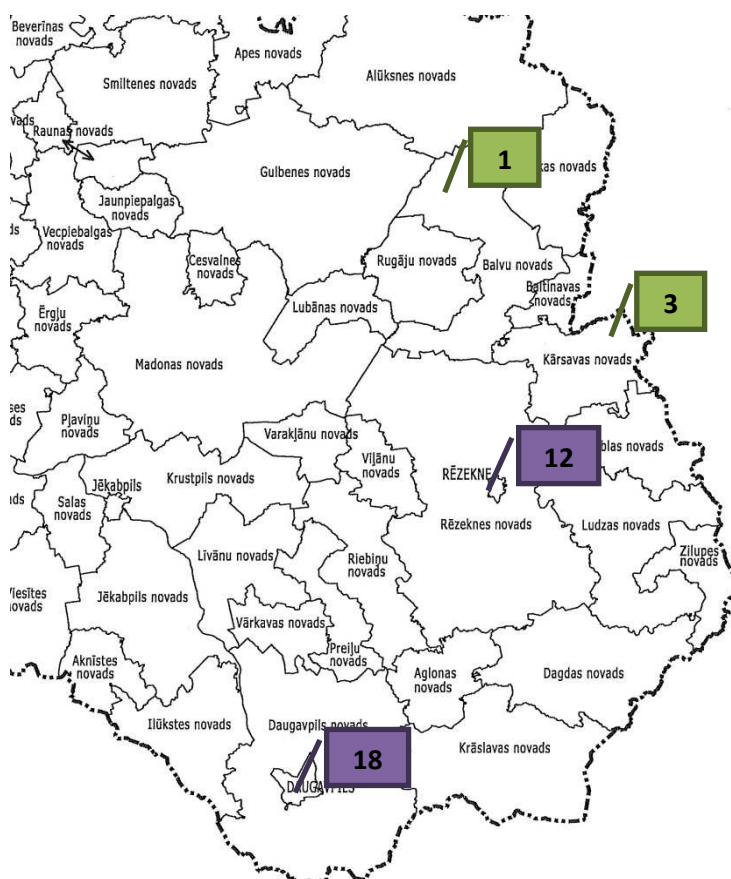
Evidently the offer provided for the students at the professional and vocational education level in Latgale region is wide – the study programs of technical, creative and social fields are equally available. Most significant features are the availability of creative industry studies mainly in the big cities, less in the regions, as well as the wide offer of technical studies,

including the processing industry and IT field, which can potentially mark the competence courses of the region in different technical fields.

First level higher education

First level higher education in Latgale region can be obtained in the biggest cities – Rēzekne and Daugavpils – as well as in Balvi and Kārsava regions. According to the information of the National Database of Educational Opportunities, the number of programs of the first level higher education is significantly smaller than the number of programs of secondary professional and vocational education, but this tendency is typical for the whole country in general. 15 educational institutions and branches thereof offer 34 study programs of the first level higher education.

The picture No 4.1.1.2 shows the number of the study programs of the first level higher education in each region and city.



Picture No 4.1.1.2. Opportunities of first level higher education studies in Latgale. Source: National Database of Educational Opportunities.

Whereas the table No 4.1.1.2. displays the educational institutions in Latgale region, which provide the first level higher education, and the available study fields.

| Educational institution/ Field of study | Daugavpils Medical College | Daugavpils University | RSEBAA | College of Accounting and Finances | Baltic International Academy | State Police College | Baltic Psychology and Management University | Rēzekne Higher Education Institution | P. Stradiņš Medical College of the University of Latvia | Higher School of Management and Social work „Attīstība” | State Border Guard College | MalnavaCollege |
|---|---|----------------------------------|---------------|---|---|-------------------------------------|--|---|--|--|---|-----------------------|
| Motor transport | | | | | | | | | | | | X |
| Construction | | | | | | | | X | | | | |
| Civil safety and defence, labour safety | | X | X | | | | | | | | | |
| Design | | | | | X | | | X | | | | |
| Medicine | X | | | | | | | | X | | | |
| Commercial sciences (real estate, accounting, management) | | | X | X | X | | | | | | | X |
| Police work | | | | | | X | | | | | | |
| Border guard | | | | | | | | | | | X | |
| Social care and social work | | X | | | | | X | X | | X | | |
| Law | | | | | X | | | | | | | |

Table No 4.1.1.2. Opportunities of first level higher education studies in Latgale region. Source: National Database of Educational Opportunities.

The best availability of the first level higher education is in the field of commercial sciences (including finances, organization management, farm management and real estate management), which can be obtained in four educational institutions. Similar availability is also in the field of social care and social work – study programs related to these are provided by four educational institutions.

The first level higher education studies in medical field are provided by two educational institutions located in Rēzekne and Daugavpils.

The first level higher education in civil defence and safety and labour safety can be obtained in two higher education institutions in Latgale region. Studies in border guard and police work each are provided by one educational institution.

Two educational institutions provide design studies – both in the programs of environmental design and fashion design.

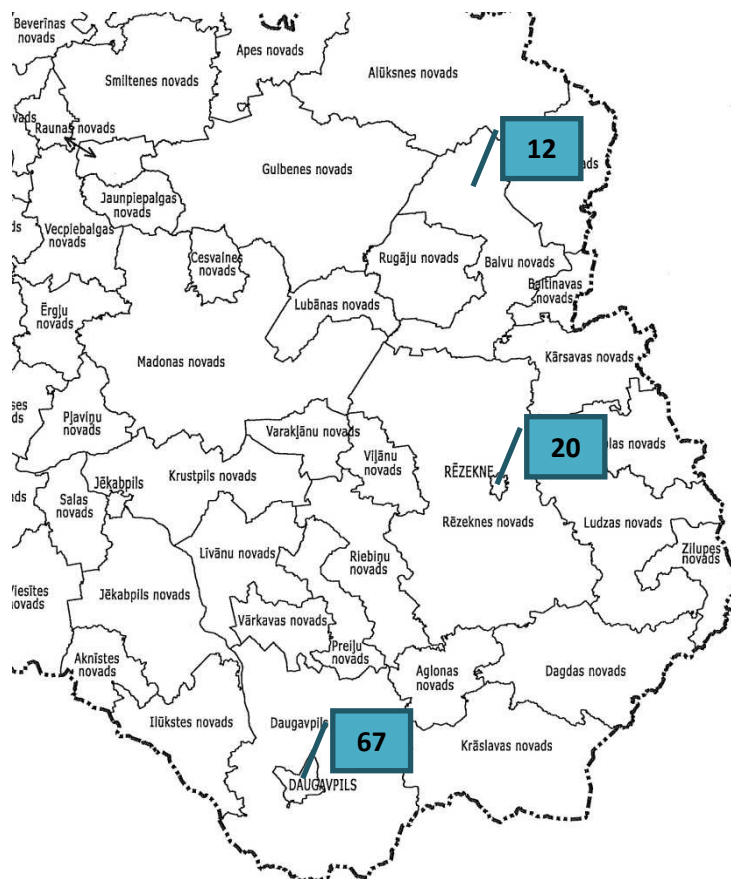
The first level higher education in the fields of law, motor transport and construction are each offered by one educational institution.

The educational institutions of Latgale region offer a wide range of first level higher education opportunities in different fields, including technical sciences, medicine, commercial sciences, social sciences and law. Wide range of knowledge is also available in the fields of civil defence, police and border guard work.

Bachelor studies

The bachelor studies are more widely offered in Daugavpils, where 10 universities and branches thereof offer in total 67 study programs, including the academic and professional bachelor studies. There are five universities and branches thereof available in Rēzekne and 20 bachelor study programs. Whereas in Balvi region there is the Balvi branch of Daugavpils University which offers 12 study programs. The biggest university of the region is Daugavpils University with approximately 6500 students enrolled.

The picture No 4.1.1.3 shows the number of bachelor study programs in Latgale cities and regions.



Picture No 4.1.1.3. Opportunities of Bachelor studies in Latgale. Source: National Database of Educational Opportunities.

The table No 4.1.1.3 displays summary of Bachelor studies by fields in the higher education institutions of Latgale region.

| Educational institution/ Field of study | Daugavpils University | Riga Technical University | Rēzekne Higher Education Institution | Balvi branch of Daugavpils University | RSEBAA | Higher School of Management and Social work „Attīstība” | Baltic International Academy | Transport and Telecommunication Institute | Baltic Psychology and Management University | Riga Aeronautical Institute | Higher School of Social Technologies | ISMA Graduate School | Latgale branch of Latvian Academy of Art |
|--|------------------------------|----------------------------------|---|--|---------------|--|-------------------------------------|--|--|------------------------------------|---|-----------------------------|---|
| Biology | X | | | | | | | | | | | | |
| Construction | | X | | | | | | | | | | | |
| Computer sciences/IT | X | X | X | X | | | X | X | | | | | |
| Design | | | X | | | | | | | | | | |
| Electronics, power, telecommunications | | X | | | | | | | | | | | |
| Philology | X | | X | X | | | | | | | | | |
| Physics | X | | | | | | | | | | | | |
| Commercial sciences | X | X | X | X | X | X | X | X | | X | | | |
| Chemistry | X | | | | | | | | | | | | |
| Mathematics | X | | | | | | | | | | | | |
| Art | X | | | | | | | | | | | | X |
| Medicine (physiotherapy) | X | | | | | | | | | | | | |
| Mechanics, mechanical engineering | | X | X | | | | | | | | | | |
| Pedagogy | X | | X | X | | | | | | | | | |
| Psychology | X | | | X | X | | | | X | | | | |
| Social sciences | X | | | | X | | X | | | | | | |
| Heat, gas and water | | X | | | | | | | | | | | |

| Educational institution/ Field of study | Daugavpils University | Riga Technical University | Rēzekne Higher Education Institution | Balvi branch of Daugavpils University | RSEBAA | Higher School of Management and Social work „Attīstība” | Baltic International Academy | Transport and Telecommunication Institute | Baltic Psychology and Management University | Riga Aeronautical Institute | Higher School of Social Technologies | ISMA Graduate School | Latgale branch of Latvian Academy of Art |
|--|------------------------------|----------------------------------|---|--|---------------|--|-------------------------------------|--|--|------------------------------------|---|-----------------------------|---|
| technologies | | | | | | | | | | | | | |
| Sociology, social work | X | | | X | | X | | | X | | | | |
| Law | X | | X | X | | | | | | | X | | |
| Translations | | | X | | | | | | | | | | |
| Tourism, hotel service | | | | | | | X | | | | | X | |
| Transport | | X | | | | | | X | | | | | |
| History | X | | X | X | | | | | | | | | |
| Environmental science | X | | X | | | | | | | | | | |

Table No 4.1.1.3. Opportunities of Bachelor studies in Latgale region. Source: National Database of Educational Opportunities.

The universities of Latgale region and branches thereof offer a wide range of Bachelor studies in different fields – exact, humanitarian, commercial sciences, medicine, pedagogy and social fields.

Daugavpils University and Rēzekne Higher Education Institution both offer a wide range of study programs, including the specifically exact studies (mathematics, chemistry, physics etc.), philology, pedagogy studies, as well as a wide range of humanitarian and social studies. Whereas the university branches are specialized in specific study fields. For example, the competences of Daugavpils branch of RTU are explicitly technical – construction, mechanical engineering, electronics and similar study fields.

The commercial sciences, which include management sciences, business and financial management, as well as economic, are provided in a wide range by virtually all universities and branches thereof – the bachelor's degree in commercial sciences can be obtained in nine educational institutions in Latgale region. therefore the availability of commercial sciences in the region can be described as adequate.

The humanitarian sciences (history, psychology, philology) are most widely available in Daugavpils University and Rēzekne Higher Education Institution. The pedagogy studies are also mostly represented by DU and RHEI.

Many university branches available in Latgale region represent specific competences, for example, the Transport and Telecommunication Institute offers studies related to transport, commercial science and IT fields, similar to the Riga Aeronautical Institute which offers Bachelor studies in transport.

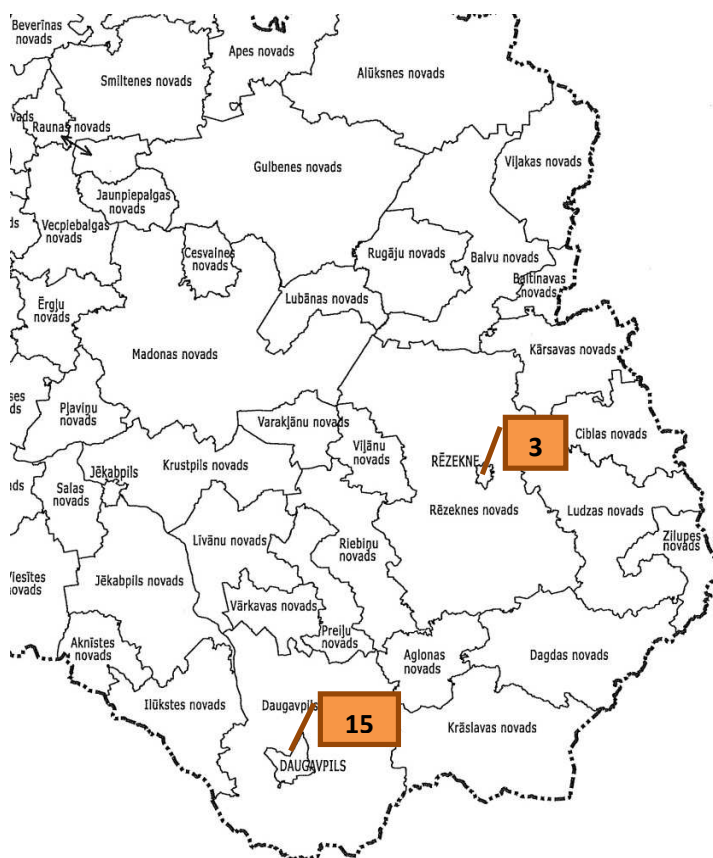
Only one study program is available in Latgale region in the medicine field – the physiotherapy studies in Daugavpils University. Studies of veterinary medicine are not available.

Master studies

Master studies in the Latgale statistical region are available in Daugavpils and Rēzekne. The widest range (14 programs) of Master studies is provided by Daugavpils University, one program is also provided by the Latgale branch of the Transport and Telecommunication Institute. Whereas the Daugavpils branch of RTU, which has wide range of Bachelor studies, does not offer Master studies.

In Rēzekne master's degree can be obtained only in Rēzekne Higher Education Institution.

The picture No 4.1.1.4 shows the number of master study programs available in the biggest Latgale cities.



Picture No 4.1.1.4. Opportunities of Master studies in Latgale. Source: National Database of Educational Opportunities.

Master studies by fields available in Latgale region are summarized in the table No 4.1.1.4. It shows the courses of Master studies and availability thereof in the regional educational institutions.

| Educational institution/ Field of study | Daugavpils University | Transport and Telecommunication Institute | Rēzekne Higher Education Institution |
|--|-----------------------|---|---|
| Biology | X | | |
| Computer sciences / IT | X | X | |
| Philology | X | | X |
| Physics | X | | |
| Commercial sciences | X | | X |
| Mathematics | X | | |
| Pedagogy | X | | X |
| Psychology | X | | |
| History | X | | |

Table No 4.1.1.4. Opportunities of Master studies in Latgale region. Source: National Database of Educational Opportunities.

The widest range of Master studies is available in Daugavpils University. The competences of this higher education institution cover the exact and natural science studies, as well as commercial sciences, pedagogy, psychology and history.

Master's degree in IT can be obtained also in the Transport and Telecommunication Institute.

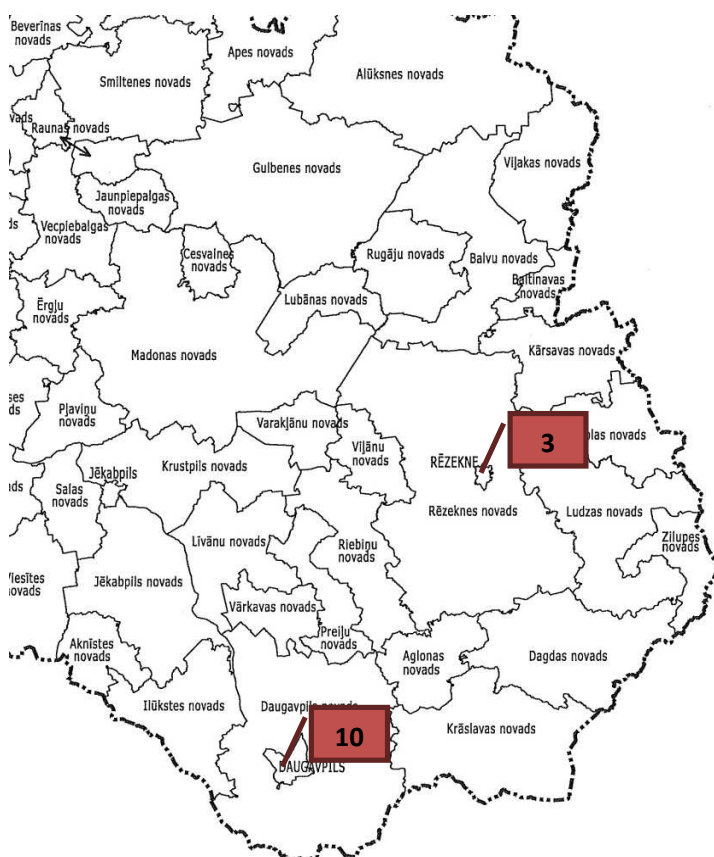
Whereas the competences of Rēzekne Higher Education Institution cover commercial sciences, philology and pedagogy.

Master level studies are not available in the field of technical studies –Daugavpils branch of RTU, which has a wide range of Bachelor studies in technical fields, does not offer Master studies. Also Master studies in medicine and social sciences are not available in Latgale region.

The field of Master studies is characterized by specialization of higher education institutions and development of specific competences within these.

Doctor studies

Doctor studies, the same as Master studies, are available in Rēzekne and Daugavpils. The picture No 4.1.1.5 shows the number of doctor study programs in each of Latgale cities.



Picture No 4.1.1.5. Opportunities of Doctor studies in Latgale. Source: National Database of Educational Opportunities.

The table No 4.1.1.5 displays courses of Doctor studies in the educational institutions of Latgale region.

| Educational institution/ Field of study | Daugavpils University | Rēzekne Higher Education Institution |
|--|------------------------------|---|
| Biology | X | |
| Computer sciences / IT | | X |
| Philology and literary theory | X | |
| Physics | X | |
| Commercial sciences | X | |
| Law | X | |
| Mathematics | X | |
| Pedagogy | X | X |
| Psychology | X | |
| History | X | |
| Environmental science | | X |

Table No 4.1.1.5. Opportunities of Doctor studies in Latgale region. Source: National Database of Educational Opportunities.

The widest range of Doctor studies are available in Daugavpils University, which offers exact, humanitarian, commercial science and pedagogy studies. Rēzekne Higher Education Institution offers a lesser range of Doctor studies, focused more on IT field, as well as pedagogy and environmental science.

4.1.2. Educational opportunities in Lithuanian border region

Vocational education and secondary professional education

Three educational institutions, offering education at the level of vocational and secondary professional education, are operating in the Lithuania border region, which has been defined as Zarasai, Visagina and Ignalina (formerly included in Utena region) for the context of this project. Two educational institutions are located in Visagina, one in Zarasai, whereas a branch of the Visagina Professional study centre of Technology and Business is located in Ignalina. In table 4.1.1.1. summarized in VET Lithuanian border region.

| Educational institution/ Field of study | Visagina Professional study centre of Technology and Business | Zarasai Agricultural school | Ignalina branch of the VisaginaProfessional study centre of Technology and Business |
|--|--|--|--|
| Motor transports | X | | |
| Office administration | X | | X |
| Construction | X | X | X |
| Computer sciences/ IT | X | | |
| Catering services | X | X | |
| Commercial sciences | X | X | X |
| Agriculture | | X | |
| Tourism and hotels | X | X | X |

Table No 4.1.2.1. Opportunities of vocational and secondary professional education in Utena area.

The offer of professional and vocational educational institutions in the Lithuania border region is sufficiently wide; eight different study courses are available. The offer of Zarasai Agricultural school

differs from the offer of the Visagina Professional study centre of Technology and Business by the agricultural program included. Whereas the offer of the Visagina Professional study centre of Technology and Business is wider; in contrast to the Zarasai Agricultural school, it offers education in motor transport (motor engineering), office administration and computer sciences as well.

Higher education

Higher education cannot be obtained in the Lithuania border region. Territorially the closest places, which provide higher education, are Utena University of Applied Sciences (Utena College) and Panevezys Institute.

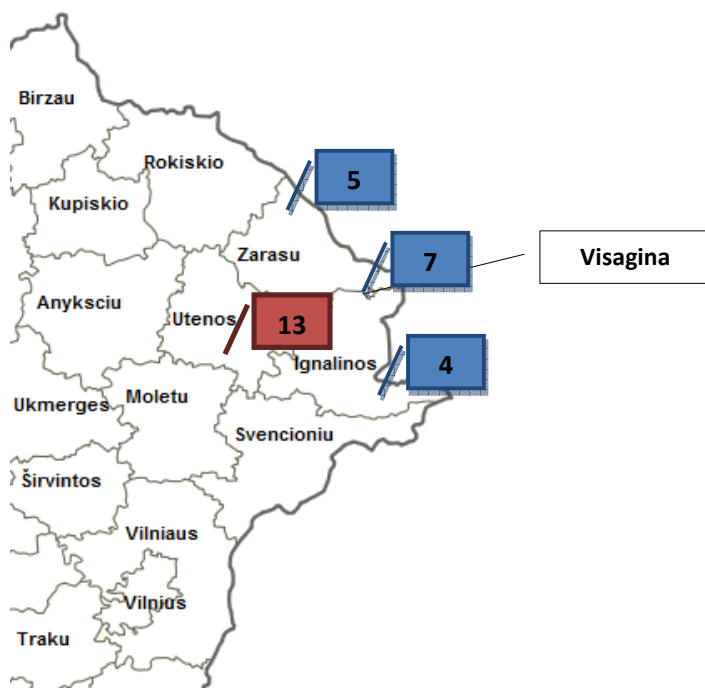
The table No 4.1.2.2 shows the courses of higher education (Bachelor) studies in the educational institutions of Utena area. Both above mentioned higher education institutions provide the opportunity to obtain bachelor's degree in the fields listed in the table No 4.1.2.2.

| Educational institution/ Field of study | Utena University of Applied Sciences | Panevezys Institute |
|--|---|----------------------------|
| Construction | | X |
| Computer sciences/ IT | X | X |
| Design | X | |
| Electronics and power engineering | X | X |
| Philology | | X |
| Commercial sciences | X | X |
| Agriculture | X | |
| Medicine | X | X |
| Music | | X |
| Food production | X | |
| Pedagogy | X | X |
| Social work | X | X |
| Dentistry | X | X |
| Transport | X | |
| Tourism, culture | X | X |
| Environmental science | X | X |

Table No 4.1.2.2. Opportunities of higher education in Utena area, near Ignalina, Visagina and Zarasai.

The table 4.1.2.2 demonstrates that the offer of higher education studies of both the Utena University of Applied Sciences and the Panevezys Institute is similar – nine of the 16 identified study courses are provided by both educational institutions.

The picture No 4.1.2.1 displays the study programs of secondary professional education and vocational education (in blue) and the study programs of higher education (in red) in Utena area, Lithuania.



Picture No 4.1.2.1. Opportunities of secondary professional, vocational education and higher education studies in Utena area.

The higher education institutions of Utena area provide a wide range of different study programs. Studies in such fields as philology and technical fields, for example, construction, are relatively less available. Compared to the situation in Latgale region, studies in such fields as telecommunications, mechanical engineering and similar are not available in the region.

4.1.3. Summary of educational opportunities in Latgale and Utena

From the secondary professional education studies until the doctor's degree, education in Latgale region can be obtained in the fields of information technologies and computer sciences, as well as commercial sciences. The availability of education in other fields varies by education levels.

For example, there are a number of study programs at the level of professional education in Latgale region, which do not provide post-graduate studies in the region; the studies can be thus continued only in other higher education institutions of Latvia. These fields are following:

- ❖ Catering services;
- ❖ Wood processing;
- ❖ Metal working;
- ❖ Agriculture and fishery;
- ❖ Music;
- ❖ Veterinary medicine;
- ❖ Commerce.

It has to be noted that there are a number of study fields which can be mastered only at the level of secondary professional or vocational education – for example, hair dresser services or shoe repair field. The possibility of continued education in these fields is not being considered.

In Lithuania border region the educational opportunities in the field of vocational education and secondary professional education are less available than in Latgale region, but the two education institutions and one branch in this region provide eight different study programs. In contrast to Latgale region, the Lithuania border region does not offer studies in such fields as wood processing, metal working, veterinary medicine and none of the creative education courses. The most available study field at this level in Lithuania border region is commercial sciences (business management, accounting).

The first level higher education studies in Latgale region are mainly related to the opportunities of Bachelor studies. After completing the first level higher education the students may continue Bachelor studies in the fields of motor transport, construction, design, medicine and commercial sciences. It has to be considered that opportunities for post-graduate medical studies are limited in Latgale region, and these are provided only in the field of physiotherapy, which means that the availability of medical studies in the region is quite restricted.

Candidates with general secondary education may enrol in any of the Bachelor study programs available in Latgale region, therefore these studies are available to all those who wish to study and have completed general education irrespective of the former educational institution. The offer of Bachelor studies in the Latgale region is wide and many different fields are available.

Fields with limited or no availability of Bachelor studies:

- ❖ Food production;
- ❖ Music;
- ❖ Medicine (available education in physiotherapy);
- ❖ Dentistry;
- ❖ Veterinary medicine.

Taking into account that secondary professional and/or first level higher education in the mentioned fields is available in the region, it can be considered that the opportunities of continued education in the mentioned study fields are inadequate. Objective consideration of introduction of such study courses in regional educational institutions would require assessment of the investments required for the establishment of study opportunities, as well as enquire the opinion of the potential students on necessity of such programs and their wish to study. It has to be considered that significant investments are required to provide certain educational opportunities that are currently unavailable – for example, in the study fields of medicine, dentistry, veterinary medicine and similar.

The educational programs offered by the higher education institutions of Utena area are similar to the higher education institution programs of Latgale region. Main differences between the studies offered by higher education institutions of both regions are found in the offer of philology and

medical studies – Latgale region has a much wider choice of philology studies, but medical study programs are virtually non-existent (except for physiotherapy program in Daugavpils University). Whereas the higher education institutions of Utena area have a limited offer of philology programs, but there are wide opportunities to study different medical programs, including therapy, nursing, physiotherapy, dentistry and other. The availability of medical studies is what makes the higher education institutions of Utena area competitive, because these programs are popular in general; employment opportunities are great after graduation and students are willing to choose these study programs. Only Bachelor level studies are provided by the higher education institution of Utena area.

Master studies in Latgale are closely related to the Bachelor study programs. Although after graduating from the Bachelor studies, in some fields the students do not have the opportunities to continue with Master studies, while staying in Latgale region (for example, motor transport, construction, mechanical engineering and other fields), but the existing Master study programs are based on those study programs which can be completed at the Bachelor level. The unavailability of studies is identified in the afore mentioned technical fields –Master studies are not available mainly in those fields, in which Bachelor studies are provided by the Daugavpils branch of RTU.

Situation is different with the Doctor studies. Daugavpils University offers the opportunity of Doctor studies after graduating from any of the Master study programs, as well as the opportunity to complete any previous education required to enrol in Doctor studies. Whereas Rēzekne Higher Education Institution offers Doctor studies also in those fields, where Master studies are not available, for example, environmental science and IT field. It means that Rēzekne Higher Education Institution potentially enrolls students from other higher education institutions for their Doctor studies, for example, from Daugavpils University or Transport and Telecommunication institute. Such situation could potentially cause problems with student enrolment.

In general the study courses at different educational levels are related in Latgale region and studies can be deemed as sufficiently available at all levels. Slightly less available studies are observed in the Master and Doctor study programs, as well as in certain study courses, which would require bigger investments. Those study courses are medicine, veterinary medicine etc. Whereas the educational opportunities in Lithuania border region are more limited as in Latgale. There are only three secondary professional and vocational education institutions operating in the region. Higher education is not available in this region, but it can be obtained in two higher education institutions in Utena area, which provide Bachelor studies in different fields. For comparison – it is possible to study up to the doctor's degree in Latgale region. One of the most important courses of competence in the higher education institutions of Utena region is medical studies which are widely represented.

4.1.4. Mutual cooperation of higher education institutions

The higher education institutions of Latgale region are mainly cooperating with other higher education institutions in the field of student exchange. The higher education institutions also implement active exchange of teaching staff and experience.

Daugavpils University cooperates with around 80 higher education institutions in different countries in Europe (United Kingdom, Belgium, Denmark, Estonia, France, Lithuania, Sweden, etc.) and elsewhere in the world (USA, Canada, China, Israel, etc.), as well as the biggest higher education institutions in Latvia – Riga Technical University, University of Latvia, etc.

Main courses of cooperation that Daugavpils University has with the mentioned higher education institutions are following:

- ❖ ERASMUS student exchange program;
- ❖ Exchange of teaching staff;
- ❖ Other / different type of experience exchange, experience exchange trips, etc.

In contrast to Daugavpils University, Rēzekne Higher Education Institution mainly participates in the projects implemented by several higher education institutions. Rēzekne Higher Education Institution takes part in the projects organized by the higher education institutions of Denmark, Italy, Japan, Georgia in the following cooperation courses:

- ❖ ERASMUS student exchange program;
- ❖ Summer school;
- ❖ Projects of internationalization of education;
- ❖ „Tempus” project for the tourism management students;
- ❖ Foreign academic practice programs.

Whereas cooperation with Latvian higher education institutions takes form of experience exchange and participation in some, short-term projects undertaken by other higher education institutions – the language courses implemented by Ventspils University College, social field projects of University of Latvia and similar events.

4.1.5. Cooperation of higher education institutions with scientific and other institutions and authorities

The most important cooperation partners of the higher education institutions of Latgale region, are:

- ❖ municipal authorities;
- ❖ scientific institutions;
- ❖ enterprises;
- ❖ foreign authorities and institutions;
- ❖ and other cooperation partners.

The higher education institutions are implementing part of the projects on their own account, mainly using the financing from EU Structural funds. The cooperation projects undertaken by both Daugavpils University and Rēzekne Higher Education Institution are implemented in similar directions. The branches of the higher education institutions also participate in several cooperation projects, but the projects these higher education institutions are mainly implemented within their

central units, focusing less on the branch units. The branch units implement projects in similar directions as Daugavpils University and Rēzekne Higher Education Institution.

The higher education institutions implement projects on their own account (with or without aid from EU Structural funds) in the following courses:

- ❖ research;
- ❖ promotion of scientific cooperation;
- ❖ improvement of study quality;
- ❖ infrastructure development;
- ❖ climate changes;
- ❖ improvement of qualification of teachers;
- ❖ cultural development.

Main municipal authorities acting as cooperation partners are Daugavpils City Council, Rēzekne City Council, Latgale Planning region, etc. Main cooperation courses are:

- ❖ participation in cross-border projects;
- ❖ participation in cultural projects;
- ❖ participation in social projects.

Research and science infrastructure projects are implemented in cooperation with scientific institutions. Higher education institutions cooperate, for example, with Latvian Council of Science, Ministry of Education and Science of the Republic of Latvia and the scientific institutions subordinated to the higher education institutions. Research projects are implemented in the following fields:

- ❖ solid-state physics;
- ❖ biology;
- ❖ anthropology;
- ❖ sociology;
- ❖ culturology.

Cooperation of higher education institutions with enterprises usually takes form of separate events, less – on the basis of projects. Most important courses of cooperation between higher education institutions and enterprises are following:

- ❖ providing practice places for students;
- ❖ operation of technology transfer offices.

International projects are implemented in cooperation with foreign institutions. Higher education institutions participate in the projects organized by European Commission and apply for foreign scholarships and similar projects. Main courses of cooperation with foreign institutions are following:

- ❖ providing foreign practice places for students;

- ❖ participation in student scholarship competitions;
- ❖ life-long education events;
- ❖ tourism projects.

Most important differences between cooperation models of higher education institutions are found in the differing courses of competence: Daugavpils University implements many research projects in chemistry, solid-state physics, biology, and other fields, which focus on laboratory studies and cooperation with scientific institutions. Whereas the course of competence of Rēzekne Higher Education Institution is social and humanitarian field; the institution participates in projects related to anthropology and culturology. Daugavpils University is more actively encouraging cooperation with municipal authorities than Rēzekne Higher Education Institution.

Utena University of Applied Sciences cooperates with other higher education institutions, state and municipal authorities, NGOs and other institutions in the following fields:

- ❖ reducing of youth unemployment;
- ❖ introducing technical studies for foreign students;
- ❖ ERASMUS student exchange program.

4.2. Scientific and research institutions in the border region

4.2.1. Scientific institutions of Latgale and their cooperation partners

Large part of scientific institutions and research centres in Latgale region are operating under the subordination of higher education institutions. The table No 4.2.1.1 displays the most important scientific institutes of Latgale region, their basic information and main operation courses. The table includes all institutions registered in the Register of Scientific Institutions of Latvia, as well as additionally those scientific centres, which are not registered in the above mentioned register but are actively operating in the field of research, participating in scientific projects and cooperating with other enterprises and institutions.

| No | Name | Address, manager | Sector | Main research areas | Cooperation partners and courses |
|----|---|--|--|---|---|
| 1. | Institute of Physical Research and Biomechanics | Maskavas street 22 - 1, Rēzekne, LV – 4604, Imants Briedis | Natural sciences, Engineering sciences | Laser physics Power engineering Optical science | Association of Latvian Young Scientists, SPIE (Society of Photographic Instrumentation Engineers), Baltic Wind Park, Latvian University of Agriculture, Institute of Solid-state Physics of University of Latvia, SIA SPD Energo, Latvian State Institute |

| No | Name | Address, manager | Sector | Main research areas | Cooperation partners and courses |
|----|--|--|------------------------------------|---|---|
| | | | | | of Wood Chemistry, Daugavpils University. |
| 2. | Institute of Ecology of the Faculty of Natural sciences and Mathematics of Daugavpils University | Vienības street 13-205, Daugavpils, LV-5400, Artūrs Škute | Environmental science | Biology (water and forest resources), Environmental science (environmental protection) | Climate changes, natural ecology, biological centres Ministry of Education and Science of the Republic of Latvia etc. |
| 3. | Institute of Comparative Studies of the Faculty of Humanities of Daugavpils University | Vienības street 13-205, Daugavpils, LV-5400, Fjodors Fjodorovs | Humanitarian sciences, Culturology | Studies in different fields of humanitarian sciences both within single culture and multicultural | Cooperation within the framework for separate events (publishing houses, independent experts, private persons, etc.) |
| 4. | Institute of Sustainable Education of Daugavpils University | Parādes street 1-432, Daugavpils, Latvia, LV-5401, Dzintra Iliško | Sustainable development | Development of sustainable education, public information measures | Baltic and Black Sea Circle Consortium in Educational Research, Latvian Academy of Sport Education, Liepaja University, Latvian Council of Science, State Education content centre, etc. |
| 5. | Institute of Systematic Biology of Daugavpils University | Vienības street 13-205, Daugavpils, LV-5400, Inese Kokina | Biology | Studies in systematic biology, animal ecology and evolution, botany, zoology, microscopy | Ministry of Education and Science of the Republic of Latvia |
| 6. | Institute of Social Investigations of the Faculty of Social Sciences of Daugavpils University | Parādes street 1-432, Daugavpils, Latvia, LV-5401, Vera Boronjenko | Social sciences | Studies in economics, sociology, law, psychology | Lomonosov Moscow State University, St. Petersburg State University, Vitebsk State Technical University, Norwegian Institute for Urban and Regional Research, Belarus State Economic University, Lithuanian Institute of Philosophy and Sociology, Oslo University, etc. |
| 7. | Latgale Research Institute of Daugavpils University | Vienības street 13-205, Daugavpils, LV-5400, Henrihs Soms | Sociology, Science of Culture | Research of Eastern Latvia (Latgale) region | Northern Lithuania Research centre of Sauliai University, municipalities of Latgale region |

| No | Name | Address, manager | Sector | Main research areas | Cooperation partners and courses |
|-----|--|---|------------------------|---|--|
| 8. | G.Liberts' Innovative Microscopy Centre of Daugavpils University | Parādes street 1-432, Daugavpils, Latvia, LV-5401, Edmunds Tamanis | Medicine Biology | Different studies in biology and medicine. Holography, nanostructure studies, focused on improvement and development of solar batteries | Latvian Council of Science, Ministry of Education and Science of the Republic of Latvia |
| 9. | Centre of Oral History of Daugavpils University | Vienības street 13-205, Daugavpils, LV-5400, Irēna Saleniece | Culturology | Studies in the fields of culture, linguistic history | University of Glasgow (United Kingdom), municipalities of Latgale region |
| 10. | Mathematic Research Centre of Daugavpils University | Parādes street 1-432, Daugavpils, Latvia, LV-5401, Pēteris Daugulis | Mathematics | Research fields: differential equations, modern elementary mathematics, mathematical didactics | State Education Development Agency, researchers from other higher education institutions |
| 11. | Institute of Art of Daugavpils University | Saules street 1/3- 203 Daugavpils, LV- 5400, Zeltīte Barševska | Art | Studies in the fields of art – architecture, musicology, applied art, textile art | Municipalities of Latgale region, researchers from other higher education institutions |
| 12. | Technology Transfer Office of Daugavpils University | Vienības street 13-210, Daugavpils, LV-5400 Irīna Gorkina | Different sciences | Promoting cooperation between entrepreneurs and scientists | Daugavpils University, G.Liberts' Innovative Microscopy Centre, Institute of Social Research, Institute of Systematic Biology, Institute of Ecology, the Foreign Language Centre, Mathematic Research Centre |
| 13. | Environmental Technology Transfer Office of Rēzekne Higher Education Institution | Atbrīvošanas alley 76, Rēzekne, LV-4601 Edmunds Teirumnieks | Environmental sciences | Promoting cooperation between entrepreneurs and scientists | SIA „Latgales Lauksaimniecības zinātnes centrs”, municipality of Rēzekne region, Rēzekne Higher Education Institution |
| 14. | Scientific Institute of Regionalization of Rēzekne Higher Education Institution | Atbrīvošanas alley 90, Rēzekne, LV-4600, Gotfrīds | Social sciences | Social – economic research of national economy and sustainable development of | Rēzekne Higher Education Institution, Latvian Academy of Science, Ministry of Education |

| No | Name | Address, manager | Sector | Main research areas | Cooperation partners and courses |
|-----|--|---|--|---|---|
| | | Noviks | | Latgale planning region | and Science of the Republic of Latvia, researchers from other higher education institutions |
| 15. | Personality Socialization Research Institute of Rēzekne Higher Education Institution | Atbrīvošanas alley 90, Rēzekne, LV-4600, Velta Ļubkina | Pedagogy, Sociology | Studies in the fields of pedagogy technologies, special pedagogy, social pedagogy and rehabilitation technologies | Latgale planning region, Ministry of Education and Science of the Republic of Latvia, Latvian Academy of Science, researchers from other higher education institutions |
| 16. | Mechatronics laboratory of Latgale Machinery and Technology centre of Rēzekne Higher Education Institution | Maskavas street 28B, Rēzekne, LV-4604 | Mechatronics, Regional economic | Use of mechatronic equipment, Research of innovative operation support structures in Latgale | Rēzekne Higher Education Institution, Latgale Machinery and Technology centre |
| 17. | SIA "Latgales lauksaimniecības zinātnes centrs" (Agriculture Science Centre of Latgale) | Kultūras laukums 1A, Vilani, LV-4650, Veneranda Stramkale | Agriculture, Biology, Engineering sciences | Research in the fields of agronomy, zootechnics, agricultural selection | Rural Support Service, Latvian Council of Science, SIA „Baltic Agro”, Ministry of Agriculture of Republic of Latvia, SIA „Latvijas šķirnes sēklas”, State Priekuli Plant Breeding Institute, State Stende Cereal Breeding Institute |

Table No 4.2.1.1.1. Scientific institutions and research centres in Latgal region.

Scientific institutions are mainly concentrated in the biggest cities of Latgale region – Rēzekne and Daugavpils. In addition ten out of 14 most important institutions are subordinated to Daugavpils University. Three scientific institutions are subordinated to Rēzekne Higher Education Institution as well. It speaks of the close cooperation of the scientific institutions with higher education institutions, teaching staff and students, as well as indicates that scientific centres are mostly established under the wing of higher education institutions. There are relatively few private scientific institutions, namely, the Institute of Physical Research and Biomechanics and SIA "Latgales lauksaimniecības zinātnes centrs" (Agriculture Science Centre of Latgale).

The most popular types of cooperation of scientific institutions are common projects with foreign cooperation partners, foreign higher education institutions and research centres, including cross-border projects. Cooperation is ongoing in the field of involving scientists from other higher education institutions. One of the most active scientific institutions to cooperate is SIA "Latgales

lauksaimniecības zinātnes centrs” (Agriculture Science Centre of Latgale), which is cooperating with other similar research institutes and research stations, enterprises, plant breeders, state authorities, etc. Mainly the cooperation of the scientific institutions with enterprises is limited, which is acknowledged both by the enterprises interviewed and the representatives of the scientific institutions.

Two technology transfer offices have been established for the purpose of ensuring capitalization of the research results – technology transfer office of Daugavpils University and technology transfer office of Rēzekne Higher Education Institution. The main activities of these offices are focused on:

- ❖ Informational, methodical and scientific support of technology transfer process;
- ❖ Informational support: publications, conferences, exhibitions;
- ❖ Services of intellectual property protection (searching for analogues and prototypes, preparing and submitting patent applications);
- ❖ Encouraging transfer of technologies of highly technological enterprises and organizations in Latvia and international market;
- ❖ Implementation of events related to technology export, including negotiations, contracting.

4.2.2. Scientific institutions of Lithuania border region

Research activities in Lithuania border region are undertaken in the Utena College (Utena University of Applied Sciences). The college has developed a mechanism for the purpose of ensuring individually applicable studies for the business sector. Student and teacher teams study certain issues and perform comparative case analysis according to the needs of specific enterprises in the following fields:

- ❖ management;
- ❖ finances;
- ❖ development;
- ❖ human resources.

Two private scientific institutions are operating in Visagina Business Incubator (4.2.2.1.table).

| No | Name | Address, manager | Sector | Main research areas | Cooperation partners and courses |
|----|---------------------------------|---|---|---|--|
| 1. | UAB "DEKRA Industrial" | Taikos pr. 7, LT-31107 Visaginas Zydrius Viliunas | Material science, metal working | Testing of metal products and materials. | Enterprises in Latvia, Finland, Sweden, Russia, etc. Material science centres in Russia CNII KM "Prometey" and CNIITMASH. |
| 2. | UAB "Modernios E-Technologijos" | Taikos pr. 7-24, LT-31107 Visagina | Power engineering, electronics, optics, ecology | Development of components and appliances in the field of renewable resources (photo-elements, solar, thermal energy), | Institute for Prospective Technological Studies, Semiconductor Physics Institute, Institute of Lithuanian Scientific Societies, State Research |

| No | Name | Address, manager | Sector | Main research areas | Cooperation partners and courses |
|----|------|------------------|--------|---|--|
| | | | | insulation materials, passive house technologies. | Institute of Specially Refined Materials in Russia, etc. |

Table No. 4.2.2.1. scientific institutions and research centres of the Lithuanian border region.

4.3. Technological enterprises

The corner stone of the innovation and technology development is the enterprises operating in the cross-border region, which directly affect the technology and innovation level of the region by their activities and perspectives for the development of new products and technologies. Studies undertaken for the business needs and the designed or overtaken products and technologies ensure the increase of the added value. The current business structure serves as basis for the development and practical application of research and technologies through commercialization of the research results.

Latgale region and Lithuania border region has traditionally been characterized by business in sectors with medium or low technology use (metal working, mechanical engineering, chemical industry, textile industry, food industry). Yet the enterprises operating in these sectors also use the possibilities to create new products and to introduce new technologies in production processes. Simultaneously some enterprises are developing in the high-tech sectors, as well as private research institutes which provide different research services for both their own needs and the needs of other enterprises as the basis of their business.

In order to evaluate the practical application and future perspectives of business research and technologies, a list of potentially innovative enterprises of the border region was made (Appendix 1). The enterprises were selected both on the basis of their economic operation results and by performing qualitative assessment of the operation sector of the company and previous experience in the introduction of new products and technologies.

The following indicators and information sources were used to select the enterprises:

- ❖ turnover of the enterprises in 2011;
- ❖ the basic operation sector of the enterprise, by assessing the technology component of the sector. Enterprises of certain sectors were not reviewed – for example, the enterprises of commerce, financial and insurance service sectors. Less emphasis was put on agricultural enterprises, selecting only those agricultural enterprises which operate with specially innovative methods (and with public information available on this);
- ❖ qualitative evaluation according to the public data (how much is invested in production, how actively the clients and partners are informed about this, etc.);
- ❖ the EU financing used for the projects that have direct connection to innovations and design of new products and technologies. The activities encouraging innovations were reviewed;

- ❖ previous summaries on innovative enterprises, for example “List of innovative enterprises according to the method of technological capacity audit tool”¹⁷¹⁸;
- ❖ information available from the regional development programs and websites of the regions on the most important enterprises within the administrative territories;

The following operation sectors are found among the potentially technological and innovative companies in Latgale region:

- ❖ production of construction materials;
- ❖ production of rubber products;
- ❖ woodworking, production of woodwork and furniture;
- ❖ peat processing;
- ❖ chemical industry (mineral products, base stock, nitrogenous compounds);
- ❖ agriculture;
- ❖ metal working, production of metal products and structures;
- ❖ food industry;
- ❖ production of plastic products and packing;
- ❖ production of plants and machinery (cooling and ventilation equipment);
- ❖ production of specific products (production of sports field equipment, production of tows, ropes, cords and nets, production of computers, production of electronic tools);
- ❖ production of textiles and knitwear;
- ❖ printing;

Whereas the Lithuania border region is characterized by the potential of technological and innovative enterprises in the following sectors:

- ❖ beer and beverage industry;
- ❖ production of construction materials;
- ❖ woodworking, production of woodwork;
- ❖ metal working, production of metal products;
- ❖ food industry;
- ❖ production of plastic products and packing;
- ❖ production of textiles and knitwear;
- ❖ printing;
- ❖ production of specific products (production of office equipment and appliances).

Although the number of enterprises identified in Latgale region exceeds that of the Lithuania border region (Latgale region is bigger by population, area and the total number of enterprises) and the sector coverage is wider, still there are several sectors where technologically perspective enterprises have been identified on both sides of the border.

¹⁷Database of innovative enterprises: <http://kju.lv/tabula/uzn.php>;

¹⁸List of the biggest enterprises composed by „Verslo žinios”
<http://archyvas.vz.lt/news.php?strid=1142&id=135627>

The most essential concentration of potentially technological enterprises is found in Daugavpils and Daugavpils region, followed by Rēzekne and its region, as well as Līvāni region. Whereas the Utena and Visagina regions are dominating in Lithuania border region.

In order to clarify the research and technology praxis and potential of the enlisted enterprises, phone interviews and in-depth site interviews were conducted with a selection of enterprises, as well as the data of the previous studies and the information provided by the stakeholders were analyzed.

When asked **if the target market of the enterprise is a local or foreign one**, the responses of the business representatives varied – about one third of the respondents replied that they are producing for the local market, five respondents admitted that the production is realized in export markets, but four respondents said that the distribution between the local and the export markets is rather equal. The innovative enterprises of Latgale are more oriented to the local markets than the export ones, whereas Utena region produces more for the export markets. One of the most innovative metal working enterprises of Latgale admitted that most of the production output was sold in the local market by 2011, but since the end of 2011 more than 80% is exported.

When asked **if the enterprise has introduced new products or services during the recent five years**, 80% of respondents admitted that new products or technologies have been introduced. The number of those respondents that had introduced new products was approximately similar to the number of those introducing new technologies and this factor depended on the sector, for example, the construction and service sectors introduced more new technologies, but the industrial sector – more new products. Those enterprises, that did not have introduced new products or services, justified it by producing specific commissioned products (in enterprises of Utena region) and short operation time of the enterprise. The enterprises of Latgale region mostly design new products and technologies on their own, without cooperating with scientific institutions or other enterprises. Whereas the enterprises in Utena admitted that they were cooperating with higher education institutions – Kaunas University of Technology and Vilnius University. One of the Latgalian respondents mentioned that they had patented the products designed by themselves as well.

According to the results of the entrepreneur survey conducted as part of the study “Perspectives of business and science cooperation”, the innovation activity of the entrepreneurs in border region was rated as average; majority of the respondents had stated that new products and technologies had been introduced in the enterprises during the recent 3 years, still their number was limited. At the same time there have been enterprises with no innovation activities undertaken as well as enterprises actively working in the field of innovations and technologies. In terms of sector distribution the industrial and service provider enterprises have been the most active in the field of innovations.¹⁹

The business representatives were asked **if the enterprise is planning to introduce new products or technologies**. More than half of the respondents replied that introduction of new products and

¹⁹Marika Rudzīte-Griķe, Ingrida Veipa, Valdis Kudiņš „Uzņēmējdarbības un zinātnes sadarbības perspektīvas”, Daugavpils, 2012

technologies is planned for or that these are under development. Two of the representatives of enterprises in Latgale region replied that new products will be designed in case if co-financing from EU structural funds will be obtained. Otherwise they did not plan to invest their own resources. Less than 30% of the respondents admitted that design and introduction of new products and technologies is not planned. Main reasons for this were lack of investments, the fact that such objective was not included in the business model, and that the managers of some companies considered the new products and technologies not necessary for them. Almost all interviewed Utena region enterprises and the majority of Latgale region enterprises were planning to introduce new products and technologies.

The results of the alternative entrepreneur survey demonstrate that less than 70% of the enterprises are planning to introduce new products and technologies in the nearest future, which has been hindered so far by such conditions as lack of financing and human resources.²⁰

When asked **what are the main preconditions for successful business development in Latgale (Utena) region in their opinion**, the business representatives gave different replies, but those of the respondents from Latgale region uncovered several types of preconditions:

- ❖ Possibilities of receiving co-financing from EU structural funds in the region;
- ❖ Tax allowances in Rēzekne Special Economic Zone (RSEZ);
- ❖ Cheap labour force available.

The given preconditions were expressed also by the participants of Latgale idejuTalka event, particularly stressing the need for financial support.

Whereas the entrepreneurs of Utena area mentioned such preconditions are available human resources, possibility to produce qualitative products for lower price, as well as opportunities for cooperation with other enterprises operating in the specific sector. The participants of the focus group also mentioned the lack of human resources and the inadequate capacity and initiative of human resources as an important hindering factor the development of Lithuania border region.

The respondents from Latgale region also mentioned a number of preconditions which should be developed, and these are following:

- ❖ Improved traffic infrastructure (for example, high-speed highway Rīga-Daugavpils);
- ❖ More available investments, including the attraction of private investors;
- ❖ Introduction of tax allowances (outside of RSEZ);
- ❖ Support for power engineering sector, thus making the energy resources more available.

The respondents mostly emphasized the role of the state, less that of the municipalities in creating the preconditions for business development. Six out of nine Latgale respondents, who replied to this question, considered that the state and the municipality should create favourable preconditions for

²⁰Marika Rudzīte-Griķe, Ingrīda Veipa, Valdis Kudiņš „Uzņēmējdarbības un zinātnes sadarbības perspektīvas”, Daugavpils, 2012

business development. Whereas none of the representatives of enterprises interviewed in Utena areon expressed such necessity.

Whereas the results of the entrepreneur survey conducted as part of the study “Perspectives of business and science cooperation” demonstrate that there are no distinctively dominating hindrances for the start-up of business in the region. The availability of financing, the administrative burden and the human factors related to risk and lack of initiative, as well as other factors were rated rather equal.²¹

When asked what, **in their opinion, are the main advantages of Latgale (Utena) region in the national and European area which make it a convenient place for establishment of businesses**, several respondents gave the following replies:

- ❖ Possibilities of attracting EU structural funds;
- ❖ Cheap and available labour force;
- ❖ Proximity to Russian and Belorussian borders.

These replies were similar among the respondents from Latgale and Utena areon. Several respondents mentioned such advantages as the vast availability of land, wide availability of ecological raw materials and low level of territory pollution. Only one respondent from Utena region mentioned the municipal support for the entrepreneurs as advantage. The availability of land was also confirmed by the participants of Latgale idejuTalka event and Lithuanian focus group, whereas the rating of availability of labour force differed on both sides of the border. If in Latgale the labour force was mainly rated as adequate and available, then in Lithuania border region the lack of labour force was emphasized.

The interview respondents were asked **what are the main reasons for the investors causing them to make a decision in favour of establishing business and investing in Latgale and Utena region**. Replies to these questions were little different to those concerning the advantages of the region, therefore it can be concluded that the enterprise representatives consider the current preconditions for business development to serve as stimulus for the investors to do business in both regions. The most frequent replies were:

- ❖ Good location, available infrastructure and proximity of Belorussian and Russian markets (this was replied by 50% of the respondents).
- ❖ Cheap, qualitative and available labour force (this was replied by 30% of the respondents).

Such criteria were mentioned as the tax allowances available in RSEZ, availability of local raw materials (specifically – timber), as well as the willingness of the entrepreneurs to design new products and the high competitiveness of the products.

²¹Marika Rudzīte-Griķe, Ingrida Veipa, Valdis Kudiņš „Uzņēmējdarbības un zinātnes sadarbības perspektīvas”, Daugavpils, 2012

Two out of ten respondents mentioned that there are no such criteria and Latgale and Utena are not favourable for investments.

When asked **which, in their opinion, are the most important sectors for the development of Latgale (Utena) region with the highest growth potential**, 60% of the respondents admitted that those were industrial sectors. The construction sector and the power industry sector (specifically the cogeneration stations) were mentioned as well. The respondents from Latgale region mentioned such specific industrial sectors as fuel production, metal working, as well as industries using ecological raw materials and producing ecological products. The respondents from Utena region mentioned furniture production and plastic product industry as most important sectors, and admitted that sectors not yet existing in the region should be developed as well.

The respondents from Latgale mentioned commerce as one of the less significant sectors, but the respondents from Utena region – the food industry. Several respondents expressed the opinion that there are no such sectors in the region, and therefore it is more important to support small and medium enterprises without focusing on sectors. The low technological level was stated as one of the problems hindering the development of specific sectors.

The respondents were asked **if Latgale (Utena) region has a favourable environment for the innovation development and research**, which was confirmed only by a third of the respondents. The respondents mentioned the following main arguments justifying why the environment is not favourable for innovations:

- ❖ Lack of state support, no tax allowances available;
- ❖ Inadequate infrastructure;
- ❖ Inadequate availability of power resources;
- ❖ Low technological level both in the enterprises and the scientific institutions.

In addition to that the respondents admitted that currently nothing is indicating an innovation-friendly environment in the region and the amount of new products and technologies introduced is insufficient.

One of the respondents admitted that only the existing enterprises enjoy an environment favourable for innovation development and research but it is not that favourable for the new enterprises. The replies of the Utena region respondents were affirmative, but the respondents admitted that there would be certain improvements needed.

When asked **what, in their opinion, should be done to encourage creation of new ideas, business growth, developing new products and technologies**, the respondents gave different replies. The most important activities mentioned by the respondents were:

- ❖ Improvement of the infrastructure;
- ❖ Introduction of tax allowances;
- ❖ Stricter supervision of the use of EU structural funds;
- ❖ Searching for qualified human resources;

- ❖ Changing social thought by putting emphasis on “green” lifestyle as well as inviting people to get involved in business.

Only one respondents from Utena areon admitted that no improvements are necessary. The respondents of Utena areon mentioned the availability of educated and qualified human resources as one of the most important preconditions for the encouragement of innovations.

When asked **in which fields, in their opinion, the promotion of research would be efficient in Latgale region and Lithuanian border region**, both the respondents of Latgale and Utena regions admitted that these had to be industrial sectors. The respondents from Utena region mentioned such sectors as ecological industry, power industry (cogeneration stations), metal working and agricultural sectors. One respondent from Latgale mentioned that it would be more efficient to promote research in those fields which have already been established in Latgale – it is not worth investing in new sectors. Another respondent mentioned tight niche sectors as the probable potential of Latgale. A third of the respondents could not name specific sectors.

The respondents of Latgale region were asked if they had cooperation partners in Utena region and the respondents of Utena areon were asked the same question concerning the enterprises in Latgale region. 75% of the respondents from Latgale admitted that they had no cooperation with enterprises from Utena. Main reasons for the failure to cooperate are:

- ❖ Different sectors, i.e., Utena region does not have enterprises of compatible sectors to cooperate with;
- ❖ Negative experience of cooperation;
- ❖ The enterprises of Utena could be rated rather as competitors than cooperation partners.

Several enterprises admitted that they were planning to cooperate with enterprises in Utena or elsewhere Lithuania in the future.

Only one of the Lithuanian respondents admitted that there is no cooperation with enterprises in Latgale. The remaining interviewed enterprises of Utena region had clients in Latgale and were cooperating with enterprises from Latgale in terms of production process.

When asked **how the respondents rated the current economic cooperation between Latgale and Utena regions in general**, 70% of them (including all respondents from Utena) had no opinion on this matter due to the lack of information. Several respondents admitted that they would like to get information on the current cooperation of Latgale and Utena and the cooperation possibilities. The remaining 30% of the respondents rated the cooperation as poor.

When asked **if the cooperation between Latgale and Utena regions is necessary**, only one respondent from Latgale replied negatively. Several respondents admitted that they would like to cooperate with enterprises from Utena region if the sectors of their interest would be represented there. Approximately half of the respondents from Latgale admitted that any type of cooperation is supportable and useful.

The respondents from Utena are also admitted that they would support cooperation with enterprises from Latgale. Mainly they wished to cooperate in sharing experience and designing products. Yet one of the respondents claimed that cooperation between Latgale and Utena enterprises is not necessary since both regions are similar in terms of development and employed technologies. Therefore it is more useful to focus on other countries with the potential of sharing essential experience, referring to Scandinavian countries and Russia as examples.

Evaluating the current business structure and business environment in the border region in general, it is evident that the economic activity is more essential in Latgale region. Although Lithuania border region has some significant enterprises, the general level of technologies and innovations is lower as in Latgale. The structure of the sectors and the interest of the entrepreneurs indicates the potential and the possibilities for cross-border cooperation. Both Latgale and Lithuania border regions offer lands for the development of business, but the situation with human resources is rated as differing.

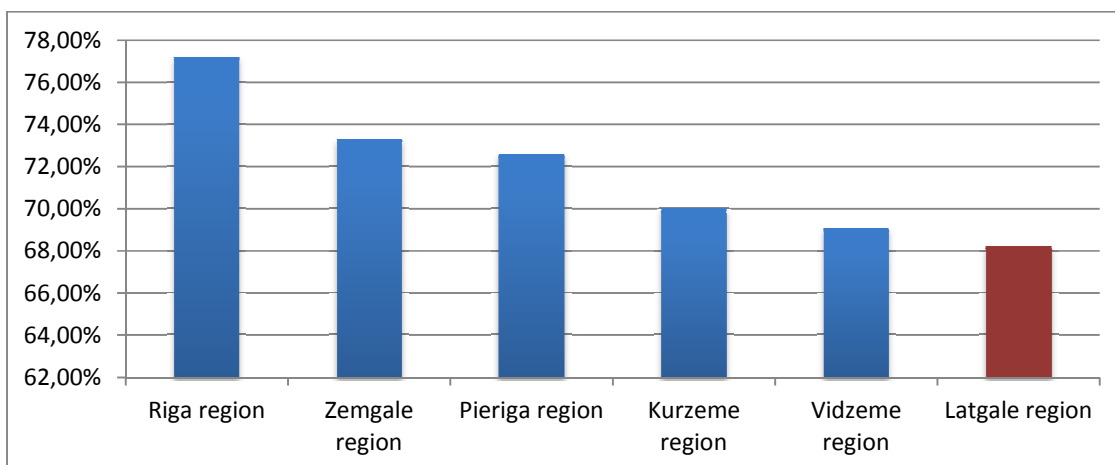
4.4. Human resources

4.4.1. Human resources in Latgale

While analysing human resources in Latgale, one of the important indicators reflecting current trends is the migration balance. The migration balance affects such indicators as employment, unemployment, availability of labour and wages. Migration balance is crucial in the analysis of time series, because it affects socioeconomic processes on a regional and national scale.

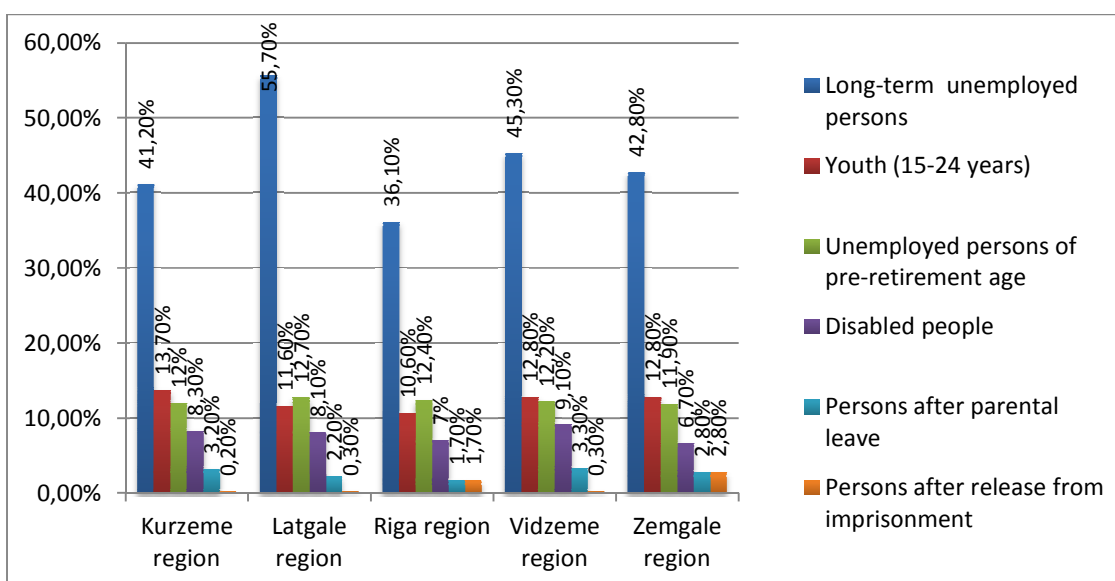
In 2010 the total migration balance in Latvia was -7912, but the migration balance of Latgale statistical region -1310. Latvia has been experiencing negative migration balance since 1991, and the trends in Latgale region are similar. Such trends could potentially cause risks of labour force shortage, higher demands in relation to wages as currently and lack of qualified human resources.

According to the results of population census, the population of Latgale statistical region in 2011 was 304 thousand, or less than 15% of all Latvian population was living in Latgale. The biggest population density is in Daugavpils (93 312 residents or 31% of all Latgale population) and Rēzekne (32 328 residents or 11% of all Latgale population). Such population density is related to opportunities of studies and work, as well as the quality of life, which is higher in the bigger cities than in the rural regions. Such statistics demonstrate that the employer is more likely to find highly qualified labour force in the cities of national significance than in regions.



Picture No 4.4.1.1. Rate of economically active residents (15-64 years old) from the total population, 2011. Source: LR Central Statistical Bureau.

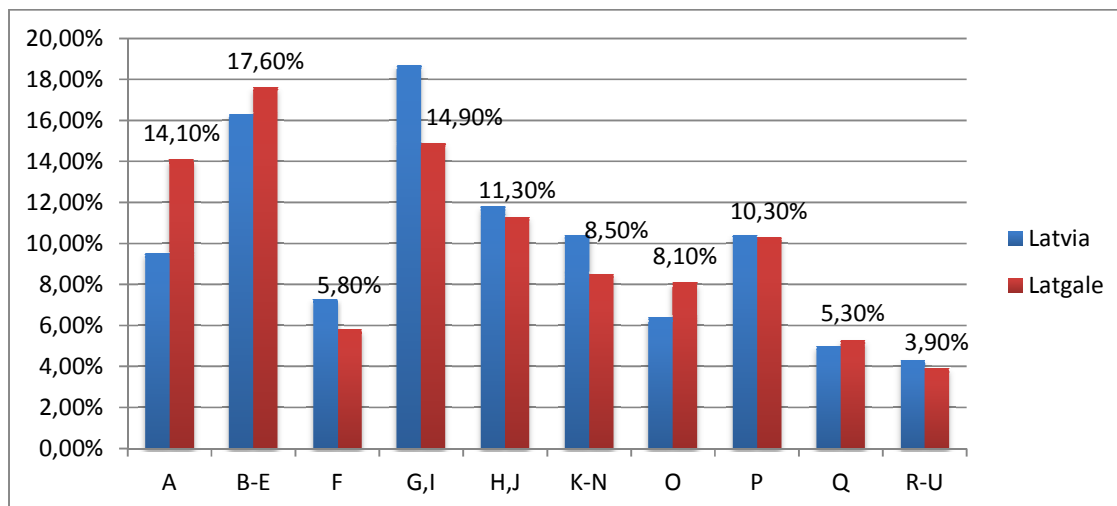
The picture No 4.4.1.1 shows the rate of economically active residents from the total population in 2011. Evidently the economic activity has been lowest in Latgale region, compared with other Latvian region. The unemployment rate in Latgale at the end of June 2012 was 22,9% (average on national scale – 11,9%) (data of State Employment Agency).



Picture No 4.4.1.2. Rate of registered unemployed persons in the regions by target groups, 2011. Source: State Employment Agency, "Analysis of the composition of unemployed persons".

The picture No 4.4.1.2 shows the rate of unemployed persons in the regions by target groups, which has been summarized by the State Employment Agency. The biggest rate of long-term unemployed persons are in Latgale region - 55,7%. In general the unemployment rate trends in Latgale region are similar to those of other regions and the average national trends. According to the information included in the document "Analysis of the composition of unemployed persons" developed by the State Employment Agency, in 2011 the youth unemployment was reduced in all regions compared to

previous years. The second lowest rate of youth unemployment on a national scale was in Latgale region (11,6%) and it was surpassed only by Riga region in this relation.



Picture No 4.4.1.3. Employment rate by sectors in Latvia and Latgale statistical region, 2011. Source: LR Central Statistical Bureau.

The picture No 3.4.1.3 displays the employment rate (in percentage) by sectors according to the classification of NACE 2nd ed. in Latgale and Latvia.

Decoding of the classification:

(A) Agriculture, forestry and fishery

(B-E) Industry and power engineering

(F) Construction

(G, I) Commerce, accommodation and catering services

(H, J) Transport, storage, information and communication services

(K-N) Finance, insurance, scientific, administrative services; operations with real estate

(O) Public administration and defence; compulsory social insurance

(P) Education

(Q) Health and social care

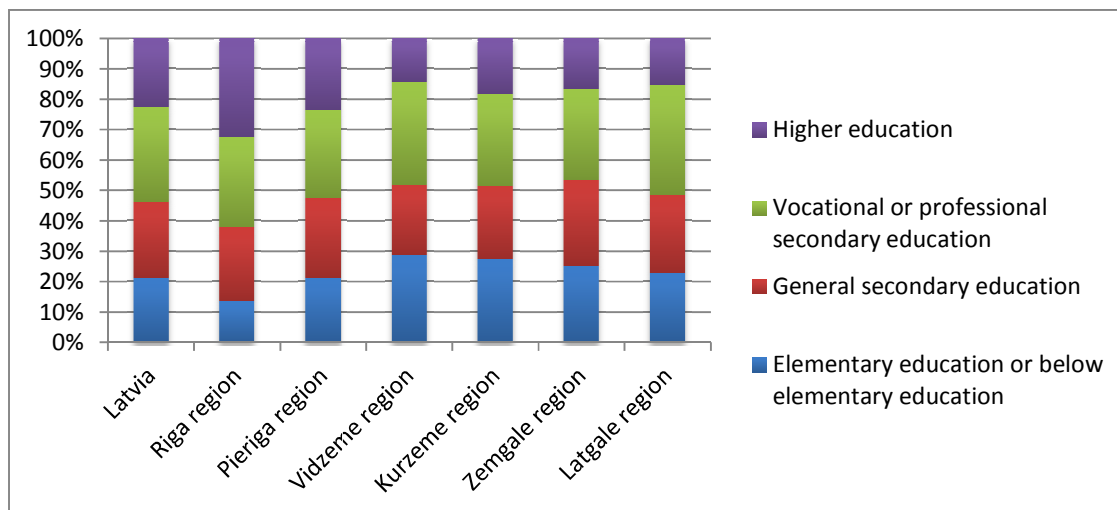
(R-U) Other economic activities

Latgale region has been compared to the general situation in Latvia, and the picture shows the percentage rate of employment in each sector in Latgale.

Majority or 17,6% of employed persons are working in the industry and power engineering sector (B-E), the second place by employment rate is occupied by commerce, accommodation and catering services (G, I) with 14,9% of employed persons. The third biggest category of employed persons is that of agriculture, forestry and fishery (A), which constitutes 14,1% of all employed persons. The least rate of employment is observed in the health and social care sector (Q), where 5,3% of the employed persons are working, and in construction sector (F), where 5,8% of employed residents of Latgale are working. 3,9% residents of the region are working in other, unclassified sectors.

The main differences among the employment sectors in Latgale and the country in total are found in such sectors as agriculture, forestry and fishery, where the employment rate in Latgale significantly exceeds the employment rate in Latvia; similar trend is observed in the sector of industry and power engineering and the sector of public administration and defence – the employment rate in these sectors in Latgale also exceeds the total employment rate on the national scale.

The employment rate in the commerce, accommodation and catering service sector falls significantly below that of the average national rate. Similar trends are observed in the sectors of construction and financial, insurance, scientific, administrative services and operations with real estate, where the employment rate in Latgale region is significantly below the average national rate.

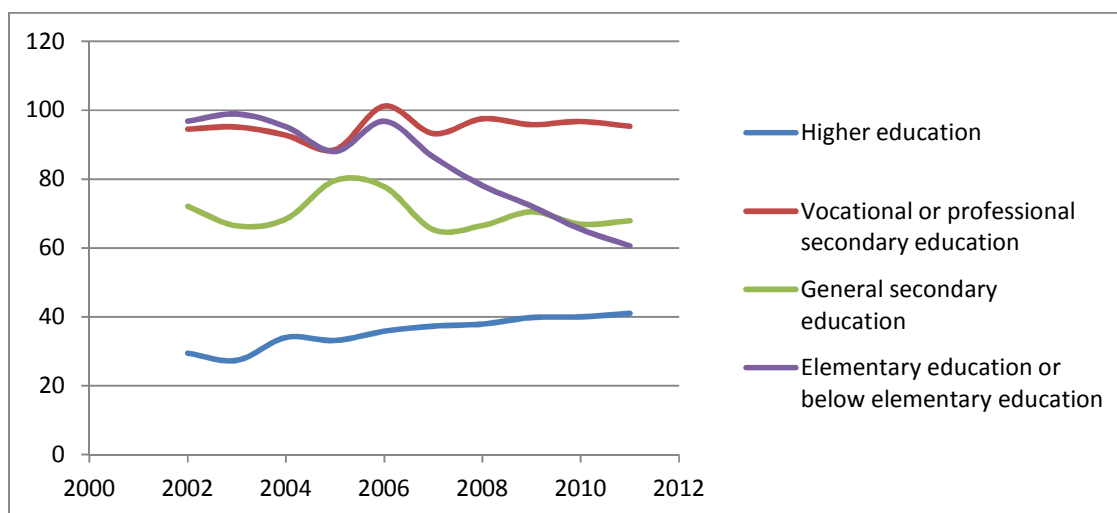


Picture No 4.4.1.4. Education attainment in Latvian statistical regions, 2011. Source: LR Central Statistical Bureau.

The picture No 4.4.1.4 shows the education attainment of the population in proportion to all working age residents. The biggest share of residents in Latgale region – 36% - have vocational education or secondary professional education. Whereas 15,5% of adult residents have obtained higher education. Considering that the higher education and the secondary professional and vocation education specifically forms the mass of residents who have qualified as professionals in a certain field, it can be concluded that more than half of the Latgale region residents have obtained professional qualification or higher academic education in some sector. Almost 26% of the region residents have

obtained general secondary education, but the proportion of residents with a finished or unfinished basic education is rather small – less than 23%.

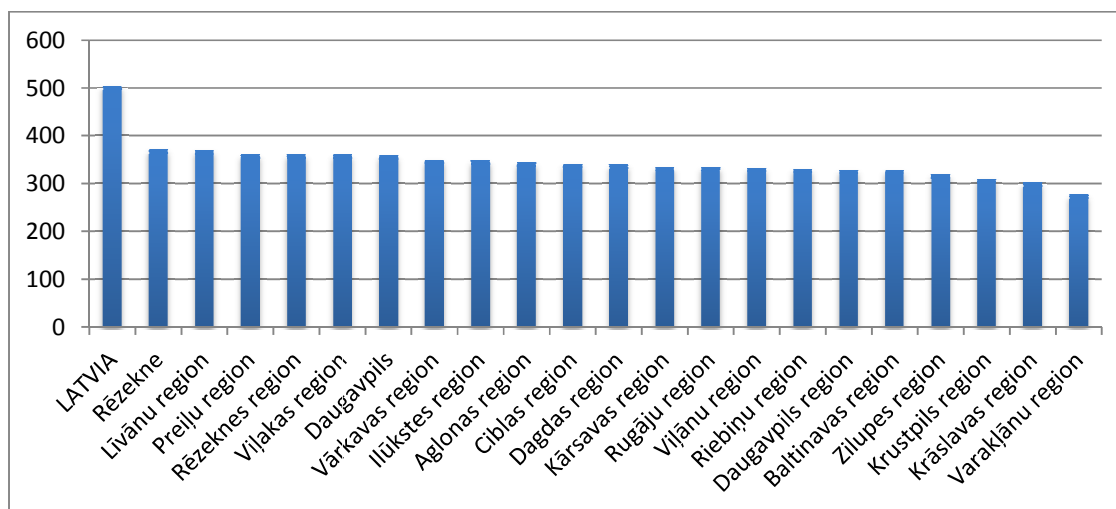
Compared to the situation in other statistical regions and the country in general, it can be concluded that the education attainment among the residents of Latgale region is similar to the average national rates. Significantly higher rates of education attainment are observed only in Riga statistical region, where the proportion of residents with completed higher or secondary professional and vocational education exceed 60% of the total population. Whereas in other regions of Latvia – Vidzeme, Kurzeme and Zemgale region – the proportion of residents with professional qualification or completed higher education falls below 50% (in Latgale – 51,5%).



Picture No 4.4.1.5. Trends of education attainment of residents in Latgale region 2002-2011. Source: LR Central Statistical Bureau.

The picture No 4.4.1.5 shows the trends of education attainment of residents in Latgale statistical region in absolute numbers (population in thousands). Evidently the number of residents with higher education is slightly growing in the region with time and the number of residents with basic education or lower education level is rapidly decreasing. Whereas the number of residents with general secondary education or secondary professional or vocational education has changed little over the time.

It has to be considered that by promoting life-long education programs, as well as inviting the people to continue the initiated studies or to start studies, and by implementing adequate support measures, it is possible to achieve better rates of education attainment of residents.



PictureNo 4.4.1.6. Average gross wage in Latvia and Latgale regions and cities, 2011. Source: LR Central Statistical Bureau.

The picture No 4.4.1.6. shows the average gross wage rate in lats in 2011 in the regions and cities of Latgale, as well as the average wage in Latvia. Evidently the average wage in Latgale region is significantly smaller than the average wage in Latvia, which was 504 lats in 2011, but in Latgale regions it varied from 372 to 277 lats. In most of the regions this difference is not pronounced, and the average wage amounts to approximately 350 lats. Those working in Rēzekne receive the best wages, followed by Līvāni and Preiļi regions. Such statistics of wages affirms that the labour force is cheaper in Latgale region than on average in Latvia.

In general the economic activity is less pronounced in Latgale than elsewhere in Latvia, and the labour force is cheaper than on average in the country. Whereas the unemployment rate by target groups in Latgale is similar to the average division on national scale, but youth unemployment is lower in Latgale than on average in Latvia. The employment rates by sectors show little difference from the average national rates – Latgale has slightly more employed persons in agriculture and less employed persons in financial and insurance sector, as well as in commerce, accommodation and catering service sector. The biggest share of employment in the region is concentrated in industry. The education attainment in Latgale is similar to the average national education attainment, with higher average education attainment achieved only in Riga region. During the recent years the number of people with higher education keeps growing in Latgale region, but the number of those residents with unfinished or finished basic education is rapidly decreasing.

4.4.2. Human resources in Lithuania border region.

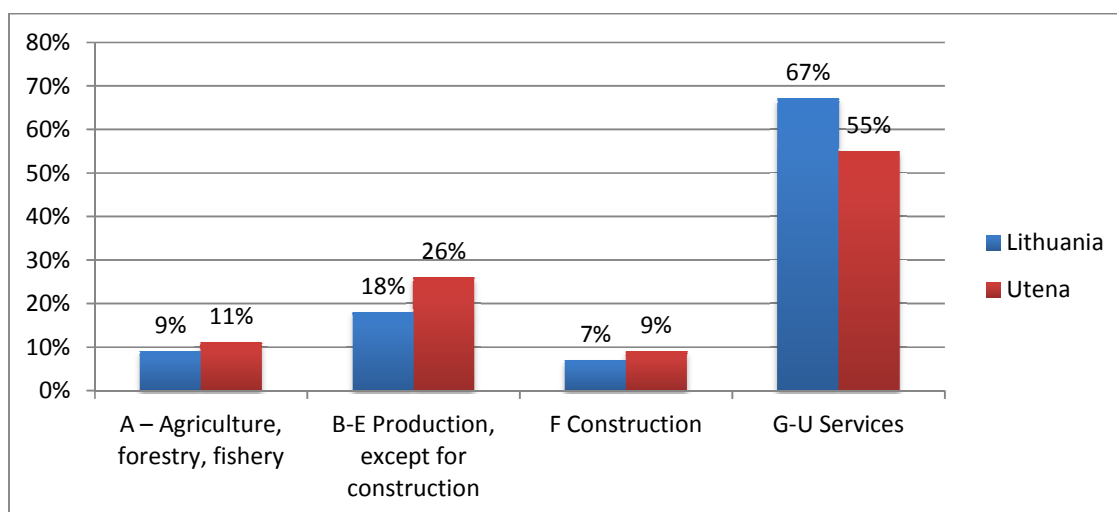
There are almost 64 000 residents in total in Lithuania border region (Visagina, Ignalina and Zarasai), which is less than in the biggest city of Latgale region – Daugavpils (data of the Lithuania Department of Statistics for the year 2011.). 73% of these residents are of working age, which speaks for a good demographic load in the region.

The majority of population in Lithuania border region reside in Visagina – 26 389 residents. Whereas the number of residents of Ignalina and Zarasai is approximately the same – almost 19 000.

Migration balance in Lithuania border region has been negative for several consecutive years. For example, in 2011 each of the territorial units had the following migration balance:

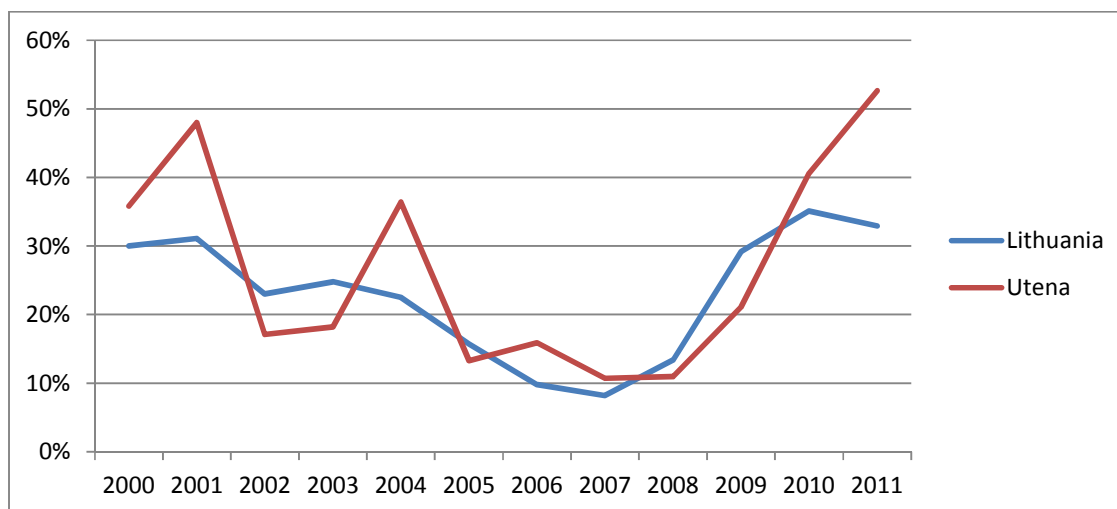
- ❖ Ignalina -125;
- ❖ Visagina -767;
- ❖ Zarasai -225.

Similar as in Latvia and Latgale region and the same as in the Republic of Lithuania, the migration balance in Lithuania border region is negative.



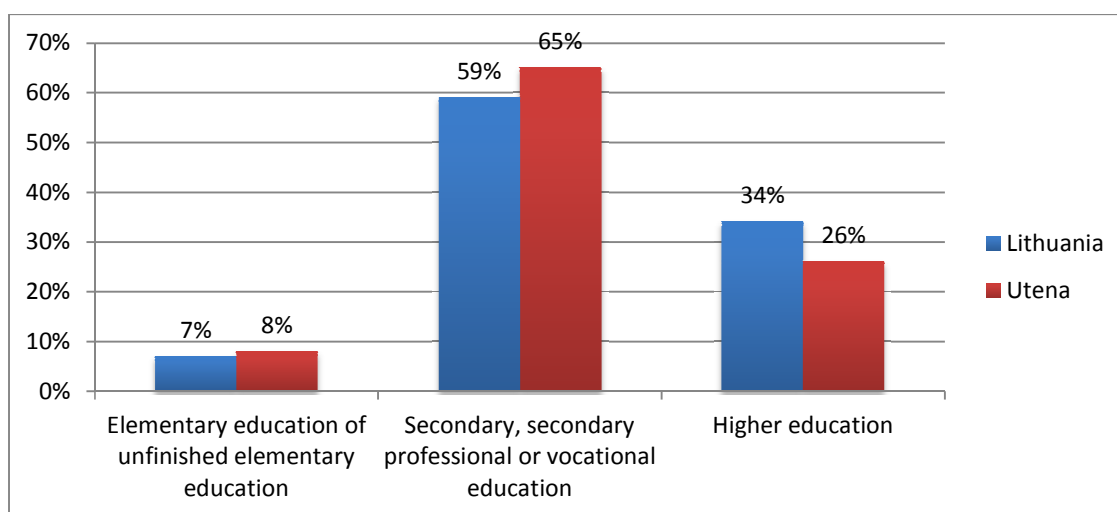
Picture No 4.4.2.1.1 Employment rate by sectors in Lithuania and Utena, 2011. Source: Central Department of Statistics of the Republic of Lithuania.

The picture No 3.4.2.1 shows the employment rate in percentage by sectors in Lithuania and Utena in 2011. Evidently one of the most important differences between the situation in Utena and Lithuania is found in the industrial sector – in Utena the employment rate in the industrial sector is significantly bigger. Whereas the employment rate in service sector in Utena has been below the average national rate.



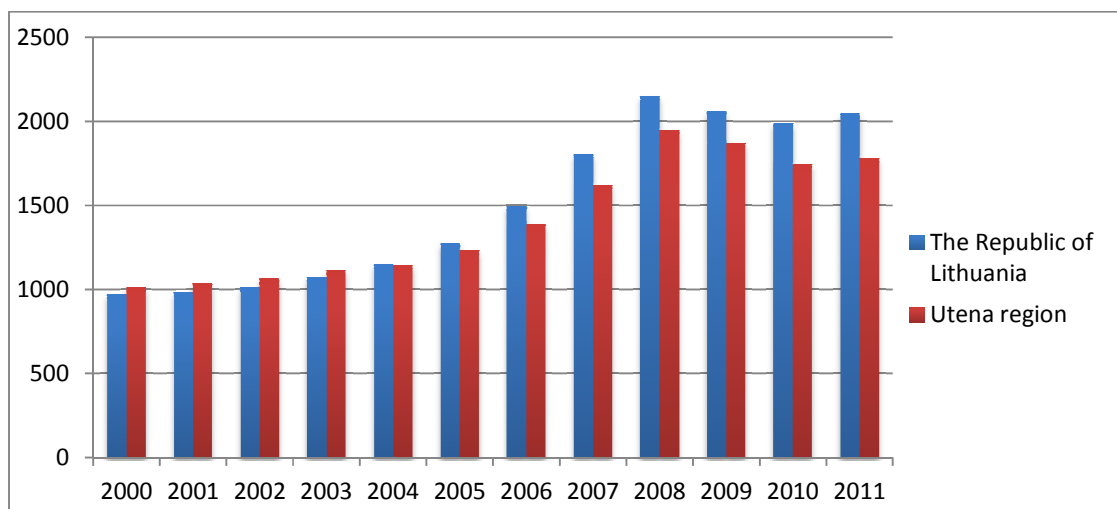
Picture No 4.4.2.2. Unemployment level in Lithuania and Utena, 2000 – 2011. Source: Central Department of Statistics of the Republic of Lithuania.

The picture No 4.4.2.2 shows the dynamics of unemployment in Lithuania in general and specifically in Utena region. As evident, the unemployment rate in Utena has been significantly exceeding the average unemployment rate in Lithuania since 2009. At the end of 2011 the unemployment rate in Lithuania was approximately 30% and continued to decline since 2010, whereas the unemployment rate in Utena at the end of 2011 reached almost 53% and has been rising since 2008.



Picture No 4.4.2.3. Education attainment rate in % from the total population in Lithuania and Utena in 2011. Source: Central Department of Statistics of the Republic of Lithuania.

The picture No 4.4.2.3 displays the education attainment in Lithuania and Utena (in % of the total adult population). Only 8% of the resident of Utena have a finished or unfinished basic education (in Latgale region – 26%), but 26% have higher education. For comparison – 15,5% of residents in Latgale region had higher education in 2011.



Picture No 4.4.2.4. Average gross wage in Lithuania and Utena region, 2000 – 2011. Source: Central Department of Statistics of the Republic of Lithuania.

The picture No 4.4.2.4 displays the average gross wage in Lithuanian lats (LT) during the time period from 2000 until 2011 in Lithuania and Utena region. The statistics of wages in Utena region allows making conclusions on the estimated situation in Ignalina, Visagina and Zarasai. Evidently the difference between the wage rate in Lithuania in general and Utena region specifically is not big. Significant difference between wage rate in Utena and Lithuania emerged in 2006, when this difference amounted to several hundreds of Lithuanian lats. Therefore in 2011 the average gross wage in Lithuania was 2045 lats (approximately 407 lats), but in Utena – 1780 lats (approximately 355 lats). The difference between the wage rate in the region and the country in general is not big – approximately 13% (for comparison – in Latvia the wage rate difference between the country in general and Latgale region amounts to approximately 30%).

The labour force in Utena region is generally available, but it is only marginally cheaper than in other regions of Lithuania. Currently the high unemployment rate can provide an environment favourable for business development, which may encourage reduction of wage and availability of free labour force. The unemployment rate in Utena region exceeds the average level of Lithuania by approximately 20%, and it has been increasing rapidly since 2008. The education attainment in Utena region is lower than the average education attainment in Lithuania, whereas in Latgale region has one of the highest education attainment rates in Latvia, competing with Riga and Riga region. When considered as percentage share from the total population in the region, the education attainment in Utena region is higher than in Latgale, and the share of those residents having only unfinished or finished basic education is small in Utena region as well. The proportion of persons employed in service industries is significantly less compared to the average rate in the Republic of Lithuania.

When assessing the compliance of the human resources to the needs of the business, human resource related questions were included in the interviews with entrepreneurs. When asked, **if in their opinion the educational opportunities in Latgale region are adequate**, 80% of respondents from Latgale replied positively. One of the respondents did not have an opinion on this issue, but one

respondent admitted that educational opportunities in technical fields are lacking. Whereas all respondents from Utena region admitted that the educational opportunities in the region are inadequate or only partially adequate. Educational opportunities in technical fields both at the level of secondary professional and higher education are lacking. Economics was mentioned as one of the fields with lacking educational opportunities in Utena areon as well.

The respondents were asked **if the available labour force complies with their business needs**. 30% of the respondents from Latgale admitted that the labour force fully complied with their needs, but one respondent mentioned that the available labour force was exactly the reason for establishing the metal working enterprise in Latgale. Part of the respondents admitted that labour force is partially compliant with the business needs; sometimes it is difficult to find employees with specific knowledge. Several enterprises operating in the chemical industry and power engineering industry admitted that great deal of resources has to be invested in training and profiling of the employees. Departing of the qualified employees from the city or the country as well was specified as one of the regional problems.

Enterprises operating in IT field, chemical industry, as well as medical service provision are facing problems with finding labour force. Whereas the opinions on metal working specialists are divided – one of the representatives of the metal working enterprises interviewed admitted that labour force is widely available, but other respondents operating in this field admitted this as a problem.

Only one of the four respondents from Utena areon admitted that there are no problems with labour force, because young people are inclined to return to their native Utena region after finishing studies in the biggest higher education institutions of Lithuania, because they are being offered job opportunities there. The textile manufacturers and metal working enterprises are facing this problem. Whereas the chemical industry enterprise did not consider this to be a problem.

4.5. Assessment of the situation of youth in the border region

A significant problem in the border region is the outflow of the population, especially the young people, to other regions and abroad, which can be mainly explained by the lack of employment possibilities in the region. Current factor affecting the youth employment is that young people choose to master those professions which are not demanded in the regional labour market (social sciences, law, economics, etc.).

The higher education institutions of the border region are facing the reduction of the student number. The number of students paying their tuition fee in the Daugavpils University has reduced by 300 compared to the previous year, but in Rēzekne Higher Education Institution this number has been negative for the last five years. The manager of the Studies department of Rēzekne Higher Education Institution Alvīne Kazinska points out that “some students choose to take the loan, but many are afraid to do so, now knowing whether they will be able to find a job after the studies. There are many cases when the student has to interrupt the studies because they cannot afford to pay. The most enthusiastic ones go abroad, earn the missing funds and return to complete the studies, but

some remain abroad."²² The situation is similar on Lithuania side as well, as verified by the focus group participants; in Utena College the study places are not even filled out. It is important that young people, who have not entered the higher education institutions after graduating from high school, are provided the possibility to acquire professional skills, by offering one-year programs and using the existing resources of the professional education institutions. There are socially held prejudices in relation to the prestige of the professional education, as well as the so called "simple professions" (tractor drivers, milkmaids, etc.), considering these to be backward, not related to the high-tech and innovation possibilities.²³

The motivation of the youth to acquire education and the wish of the population to get involved in the informal education programs and improvement of the professional qualification has significantly reduced as well. The study undertaken by SKDS in 2011 demonstrates that, in order to ensure employment possibilities and long-term income for themselves, 13% of Latgale residents want to study to enhance their qualification, whereas 11% want to study to retrain.²⁴

Young people in Latgale are generally satisfied with the quality of life (educational opportunities, hobby and leisure opportunities, finances, health and safety); 30% of respondents are fully satisfied and 55% are rather satisfied; young people in Latvia in general show similar values (respectively 32% and 54%). Yet overall the young people of Latvia admit that the most urgent issues to be solved are related to employment possibilities, leisure and educational opportunities in particular.²⁵

The residents of Latgale mention the workplace at the place of residence as the most important factor for remaining in Latgale (58%). The other most important factors are the possibility to acquire the real estate property with low maintenance costs (29,8%), the possibility to ensure good quality kindergarten and school education and hobby groups for children (23,8%), regular public transport communication to the biggest cities of the region (22,5%), the possibility to study free of charge in the higher education institutions in Daugavpils or Rēzekne (22,3%), the possibility to receive support for the establishment of own business (20%).²⁶

The participants of Latgale idejuTalka emphasized the business support measures in particular as the most important factors for recruiting and keeping the young talents in the region, both by creating new jobs and enhancing the business skills among the youth. Improvement of the educational content was mentioned as a significant aspect as well, by promoting cooperation with the entrepreneurs and adjusting the educational programs to the requirements of the labour market at different educational levels, as well as subsidizing employment in the technological sectors of regional importance. In order to encourage the activities of the new scientists and researchers in the region, the need to improve the science and research infrastructure, to ensure career opportunities for the scientists through participation in the EU co-financed research projects and to establish the

²² Neatkarīgā Rīta Avīze „Par maksu studējošo skaitu sarūk”, 20.09.2012

²³ MEPRD „Rīcības plāns Latgales reģiona izaugsmei 2012.–2013.gadā”, 2012

²⁴ MEPRD „Rīcības plāns Latgales reģiona izaugsmei 2012.–2013.gadā”, 2012

²⁵ LR MES „Aptauja ikgadējā monitoringa ietvaros par jauniešu dzīves kvalitāti, iesaistīšanos brīvprātīgajā darbā, jaunatnes organizāciju darbībā un piekļuvi jauniešiem aktuālai informācijai 2011”, 2011

²⁶ Research centre SKDS, „Latvijas iedzīvotāju aptauja atskaite VARAM”, 2012

regional talent agency was identified. Whereas the participants of Lithuania focus group emphasized the necessity to provide youth with the professional skills compliant with the labour market, thus creating favourable conditions for entering of new enterprises in the region and establishment of jobs. The existing good practice in Utena College was stressed, where active cooperation is undertaken with entrepreneurs to form the education offer.

In Latgale it is planned to solve the youth education and employment problems at the regional level. The Action Plan for Development of Latgale Region for 2012-2013 envisaged several measures oriented towards the youth of Latgale region both by enhancing the educational opportunities, promoting employment and developing business skills:

- ❖ Informing young people about cooperation and business in rural areas, by organizing information days in the professional education schools, informing the cooperative managers about possibilities for common growth of the farmers, good practice cases;
- ❖ Informal education programs of undertaking and creativity for young people and adults within the secondary and professional education institutions and the youth and adult education centres;
- ❖ Integrating business and economic issues in the content of different academic program samples;
- ❖ Business competitions for the students and teachers of general education institutions (Best business teacher of the Year, Best business idea of the students of the Year, etc.);
- ❖ Reviewing of professional education programs by involving a maximum range of sector experts, including the councils of sector experts, mainly relating to the needs of the regional labour market;
- ❖ Youth training (assistance in formulation of business ideas, business estimates, idea implementation), which result in business plans that can be submitted to apply for financing to establish new enterprises;

The action plan also envisages introduction of supporting measures to recruit young specialists to work in Latgale region, which would help to keep the existing specialists in the region and recruit young people from other regions to work in Latgale after graduating as well.²⁷

Lithuania has implemented several national measures. The developed Long-term youth policy strategy 2010-2018 envisages measures for improvement of youth employment by encouraging business and social entrepreneurship, creating favourable preconditions for involvement of young people in the labour market, as well as combining family and work. In order to encourage the employment of those young people who lack adequate education, "first job" scheme was elaborated which combined the professional education and subsidized jobs. Measures were undertaken for promotion of business. In order to ensure employment in the regions with lower economic activity,

²⁷ MEPRD „Rīcības plāns Latgales reģiona izaugsmei 2012.–2013.gadā”, 2012

support scheme was introduced to cover transport and accommodation costs for those residents working farther away from their homes.²⁸

²⁸ Boguslavas Gruzevskis, Inga Blaziene „EEO Review: Youth Employment Measures, 2010 Lithuania”, 2010.

5. European Union and global trends analysis

Development of innovations and new technologies is one of the preconditions for ensuring sustainable development both on national and regional scale. Comprehensive elaboration of strategy for research and technology development (in Latvia-Lithuania border region) requires inquiry and analysis of such aspects as EU and global innovation policy trends, as well as the best practice cases of introducing both innovation policy and innovation strategies.

5.1. Innovation policy and trends of European Union

Currently European Union is undergoing changes which include elaboration of a new strategy and approach to innovation processes in all member states. Innovation Union is one of the seven initiatives of Europe 2020 strategy with the objective of improving innovations at all research and development levels. The policy makers emphasize that the initiative will have an impact in creation of new jobs, social development and growth in the “green” thinking.²⁹ European Union has the need for a common policy, better coordination of processes and increasing of the role of science in the current public. As it can be seen from the picture No 5.1.1., Innovation Union comprises several other regulations and document packages. For example, the regional policy for innovation with the goal of supporting and developing innovations in the regions, creating synergy between the academic and business environment. The regional policy requires introduction of certain aspects to implement the Europe 2020 strategy:³⁰

1. a region’s competitiveness has to be strengthened by targeting resources to high value-added activities, by supporting improvement of skills and education, as well as improving the infrastructure;
2. it is important to develop strategies specialized in development of a specific industry and being in conjunction with other EU policies:
 - a. to form innovation clusters for companies in order to share infrastructure and services;
 - b. to ensure favourable conditions for innovative SMEs that have a key role to play in employment, EU development;
 - c. education in research and development in partnership with universities and local enterprises;
 - d. creating of regional research infrastructure;
 - e. supporting of culture and creative industries;
 - f. improving of IT technology infrastructure;
 - g. efficient use of EU structural funds and their availability for the public;

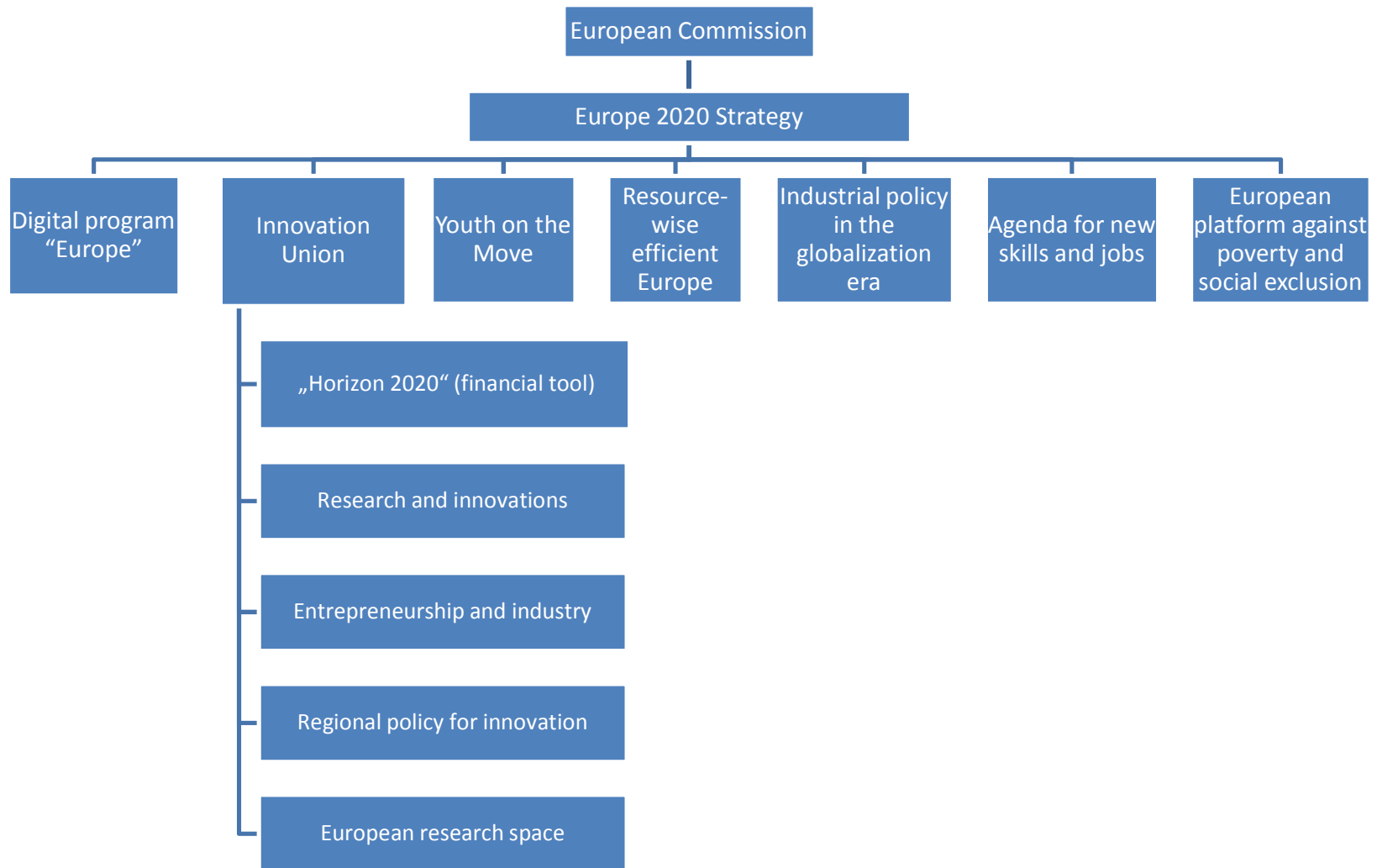
²⁹European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions strategy “Europe 2020” flagship initiative “Innovation Union”, 2010.

³⁰ “Regional Policy serving innovation”, 2011; available at:

http://europa.eu/legislation_summaries/research_innovation/general_framework/em0042_en.htm

- h. Contribute cooperation at all levels of innovations in order to address climate changes, natural resource and energy efficiency, as well as demographic ageing.
- 3. fostering of certain business sectors;
- 4. multi-level governance systems have to be implemented;
- 5. link between the policy makers and the regions is an integral component.

The emphasis is on the need to implementation of regional policy and other initiatives as well, which achievement of the target of Europe 2020 strategy – 3 % of the EU gross domestic product (GDP) shall be invested in research and development.



Picture No. 5.1.1. Structure of Europe 2020 strategy

5.1.1. Availability of stable financing for research and innovations

One of the main challenges faced by the innovation policy makers is to optimize and improve the availability of investments/financing for research and development. It is important to elaborate and implement an optimal fiscal policy which would protect those funds that are required for research and development. The main objective for the policy makers is to increase export and create new jobs and to achieve the enterprises should be focused mainly on development of new products and services. It is important to define criteria to help assessing the use of the allocated funds, since it will enable improvement of the common system and encourage more efficient allocation of funds.³¹

The financing aspect is emphasized in the Europe 2020 strategy as well – the innovation union initiative which stipulates the financial tools available to the regions for the purpose of innovation development. One of the primary financial tools is the European Regional Development Fund, financing to research could be used from the 7th Framework program and the competitiveness and innovation framework program of European Union.³² It is also emphasized that regions with a relatively low innovation level should select industries or sectors with the highest growth potential and define specific technologies to be invested into. From 2014 EU restricting of the sources of funding is planning to implement a program with the objective to support global competitiveness of SMEs, to encourage entrepreneurship, development of sustainable enterprises, etc. The estimated budget amounts to 2.5 billion euro with municipalities and regions being one of the main winners.³³ In addition it is planned to implement the program „Horizon 2020” with the objective of merging all current EU aid funds for research and innovations in a single, specific system in order to create a transparent and clear financing procedure with equal terms for all applications and participants.³⁴

5.1.2. Non-compliance of qualification

The European Union needs more closer integration of the education system and the implemented innovation policy. Several EU member countries consider this to be a special challenge since innovation policy should go in hand with several other laws, for example, the regulations on education, employment or taxes. This policy needs to be settled to enable development of the regions and support to the innovations, since it will create an environment where the qualification of the new professionals would comply with the current market demand. It is clear that additional financing for research and development requires involvement of the most qualified and talented researchers and scientists. To achieve this, both the countries and the regions have to develop a policy which would enable mutual interaction of the above mentioned aspects and positive outcome. Special attention to these problems is paid by such EU member states as Denmark, United kingdom,

³¹H. Acheson, K. Izsak and P. Markianidou, “Innovation Policy Trends in the EU and Beyond”, 2011.

“Innovation Policy Trends in the EU and Beyond”, 2011.

³²European Commission, Commission Communication to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the regions “Regional Policy contributing to smart growth in Europe 2020”; Brussels 2010.

³³„Competitiveness and innovation framework”; available at: http://ec.europa.eu/cip/cosme/index_en.htm

³⁴European Union research and innovation programme horizon 2020 website: http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020

Estonia and Poland. The Europe 2020 strategy also emphasizes that the compliance of the professionals qualification to the market demand needs to be improved.³⁵

5.1.3. Social challenges

Social challenges or problems and their direct connection to innovations is being discussed not only at the level of EU debates but also in several other countries. Innovations are considered to be the driving force behind new technologies ("green technologies", biotechnologies or nanotechnologies) and solutions which would enable solving the emerging problems. The best practice cases from such countries as Netherlands, Sweden, Norway demonstrate that there have been specific programs and measures implemented where the technological research is specifically focused on social challenges, for example, important studies of "green technologies" are undertaken to reduce global warming effect. Demographic ageing also presents a challenge to several countries, therefore it is important to implement such innovations which would enable to improve the quality of life (transport, medicine, construction etc.). In general the bigger countries have the tendency to support the "green growth" concept, which includes the idea that economic growth should not be pursued at the expense of environmental or natural degradation.³⁶ The most important question is how to achieve this under the political and legislative context. Since different regulations and laws have already been introduced, these are not able to solve the wide range of problems. It has been deemed that particularly the innovations in "green" technologies serve as solutions to the current challenges. Such type of innovations ensures sustainable development of the country, because "green" technologies would solve environmental problems, as well as social problems, for instance, the new enterprises would create new jobs. Several European countries are working on such innovation laws, programs and initiatives that would support sustainable and environmentally friendly development, and the Europe 2020 strategy, specifically the initiative "Innovation Union" also puts special emphasis on the above mentioned aspects.³⁷

5.1.4. Interaction of business-universities in research and innovation policy

All EU member states with any level of innovation are facing one challenge – to ensure exchange of knowledge between the business and the academic domains. One of the most important reasons is to specialize, to differ and to ensure competitiveness at the global markets, which is especially important for the regions with low innovation level. Such policies are in a very early development stage specifically in the youngest EU member states, and the countries rely more on the structural funds, investing the money to create adequate infrastructure for research instead of investing in innovations. Sustainable business model development is lacking, which prevents establishing of long-term and efficient relations with the academic domain. Secondly, new regulations are required to support the commercialization of the university research results or ideas, i.e., realization thereof in a

³⁵ „Europe 2020” strategy home page: http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/priorities/smart-growth/index_en.htm

³⁶ "Innovation Union" available at: http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=key

³⁷ European Commission, Commission Communication to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions "Regional Policy contributing to smart growth in Europe 2020"; Brussels 2010.

specific market. For example, Poland has developed a policy which defined specific commercialization objectives so that state economy would benefit from the research and development activities of university. Important role is still played by cluster programs and knowledge transfer initiatives (Technology Transfer Offices, incubators). Whereas the summary of “Innovation Union” emphasizes that small and medium enterprises have to use EU-wide networks to be able to compete in the global market, to use financing and to design sustainable solutions.³⁸

5.1.5. Expanding the content of the innovation policy

Based on the information described above, it is evident that solving social challenges is the focus of innovation policy makers in different EU member states. Still additional attention is paid to the creative industries as well, which covers different sectors – both the public innovation sector and the social innovations. Although specific priorities have not been defined for these industries, new initiatives are being implemented. Different programs have been developed in Austria, France and Belgium, supporting the creative industries both financially and providing consulting or contacts. The academic domain is discussing a specific innovation policy for social innovations particularly, for example, in Austria specific micro-credit systems have been introduced to enable unemployed and potentially unemployed persons to start their business.³⁹

5.1.6. Efficiency of the innovation policy

EU member states are putting increasingly more emphasis on evaluation of the innovation policy in order to understand the positive and the negative aspects and to make relevant changes.⁴⁰ It is important to introduce specific criteria to allow assessing the quality and efficiency of the developed policy. Many member states are lacking efficient mechanisms to evaluate the developed policies or it is not performed due to additional resources required. It has been observed that EU member states with higher innovation level have introduced strict criteria for the evaluation of the innovation policy and it has allowed them to improve the system and encourage further development. Policy evaluation is an integral part of the creation and improvement cycle, but there are very few studies which actually prove the efficiency of the implementation of the innovation policy. Though the project “Study on Latvian innovation system”, elaborated by Latvian Technological Centre, was implemented in Latvia. The outcome of the project was an index which can be used to evaluate the innovation capacity of the enterprises but it is not yet clear what actual benefit has been achieved from this evaluation.⁴¹

³⁸ European Commission, Commission Communication to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the regions “Regional Policy contributing to smart growth in Europe 2020”; Brussels 2010.

³⁹ H. Acheson, K. Izsak and P. Markianidou, “Innovation Policy Trends in the EU and Beyond”, 2011.

⁴⁰ European Commission, Commission Communication to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the regions “Regional Policy contributing to smart growth in Europe 2020”; Brussels 2010.

⁴¹ Jānis Kristapsons, Anita Draveniece, Anda Adamsone-Fiskovica “Mini country report Latvia”, 2011

5.1.7. Internationalization of the innovation policy

As we are living in a globalization era, it is important to develop such policy which would simultaneously stimulate innovations and internationalization.⁴² It would facilitate mutual cooperation of enterprises, research centres and universities from different countries. Currently more emphasis is put on cooperation within different types of studies on international scale. For example, when developing a common science policy, research centres and universities would find it easier to cooperate with a rapidly growing economy like Brazil or India.

5.2. Global trends of the innovation policy

After summarizing and analyzing information from different sources, it was concluded that global trends of the innovation policy in advanced countries and developing countries are not disparate from those found within European Union. One of the sources identified four main trends:⁴³

- 1) State supported technology programs;
- 2) Innovation brokers, agencies which implement the developed policy (to link university studies with the industry);
- 3) To ensure producer – user relations;
- 4) To invest certain share of GDP in research and development.

State supported technology programs have been traditionally focused on financing and developing of such innovations that would ensure sustainable development. It was mentioned that direct support is provided to solutions which could address the main social problems, i.e., climate changes, economic recession, rapid ageing, unemployment and other social problems.⁴⁴

Main challenge in the development of the innovation policy is the worldwide globalization. Policy makers should consider how to internationalize different types of initiatives. Innovation policies of several countries consider the possibilities for small and medium enterprises to compete on the global scale, therefore cross-border cluster programs and contact exchange measures are being implemented.⁴⁵⁴⁶

⁴²; Marcus Conlé, David Shim “Globale Trends in der Innovationspolitik: Best Practice für alle?”, Hamburga, 2009.

⁴³National Institute of Science and Technology Policy “Analysis of Recent Trends in Science, Technology and Innovation Policies in Selected Countries/Areas”, 2009

⁴⁴Frank Zwetsloot „Global trends in (inter)national policy support for regional innovation”, 2008

⁴⁵ Marie Ivarsson “Swedish Research & Innovation Policy Perspectives on Policy Interaction”; available http://www.spri.es/wNS/docs/publicaciones/ponencias/MARIE_IVARSSON.pdf

⁴⁶ Maastricht Economic and social Research and training centre on Innovation and Technology “INNOVATION UNION SCOREBOARD 2010, 1st February”, 2011

5.3. Case analysis–trends of the innovation policy of Estonia

The innovation development and policy in Estonia is on a higher and more professional level than in Latvia and Lithuania⁴⁷, therefore it is important to analyze and understand what particular problems the neighbour country had faced and what problems it intends to address in the future. This section will review the Estonian innovation management system, trends and main challenges of the innovation policy, recent updates to the innovation policy, internationalization of the innovation policy and efficiency of the innovation policy.

Being a small economy, Estonia has generally experienced a positive growth in innovation development, since the investments in R&D of GDP have increased by 10% annually during the time period from 2000 until 2010, which is a considerable average increase in annual section. Estonia is also planning to make investments in R&D reach 3% of GDP until 2020 which is the common objective of the Europe 2020 strategy. Also 31,8% of working age residents in Estonia are employed in industries where knowledge application is the basic activity of the institution or the enterprise. Research, development and innovation fields are dominated by the state supported higher education institutions, where 44,3% of the total expenditure for research and development are finance by the state. Estonia has relatively high rates of scientific publications against population, with 491 scientific publications being created annually per 1 million people and 10% of these publications being published in the most quoted periodicals. Different studies and surveys have demonstrated that there are approximately 400 enterprises in Estonia that are actively involved in research and development. Being a small country Estonia is actively cooperating with other scientific centres in whole Europe to exchange and improve knowledge both in the field of advanced technologies, medicine and other industries.⁴⁸

5.3.1. Management of the innovation policy

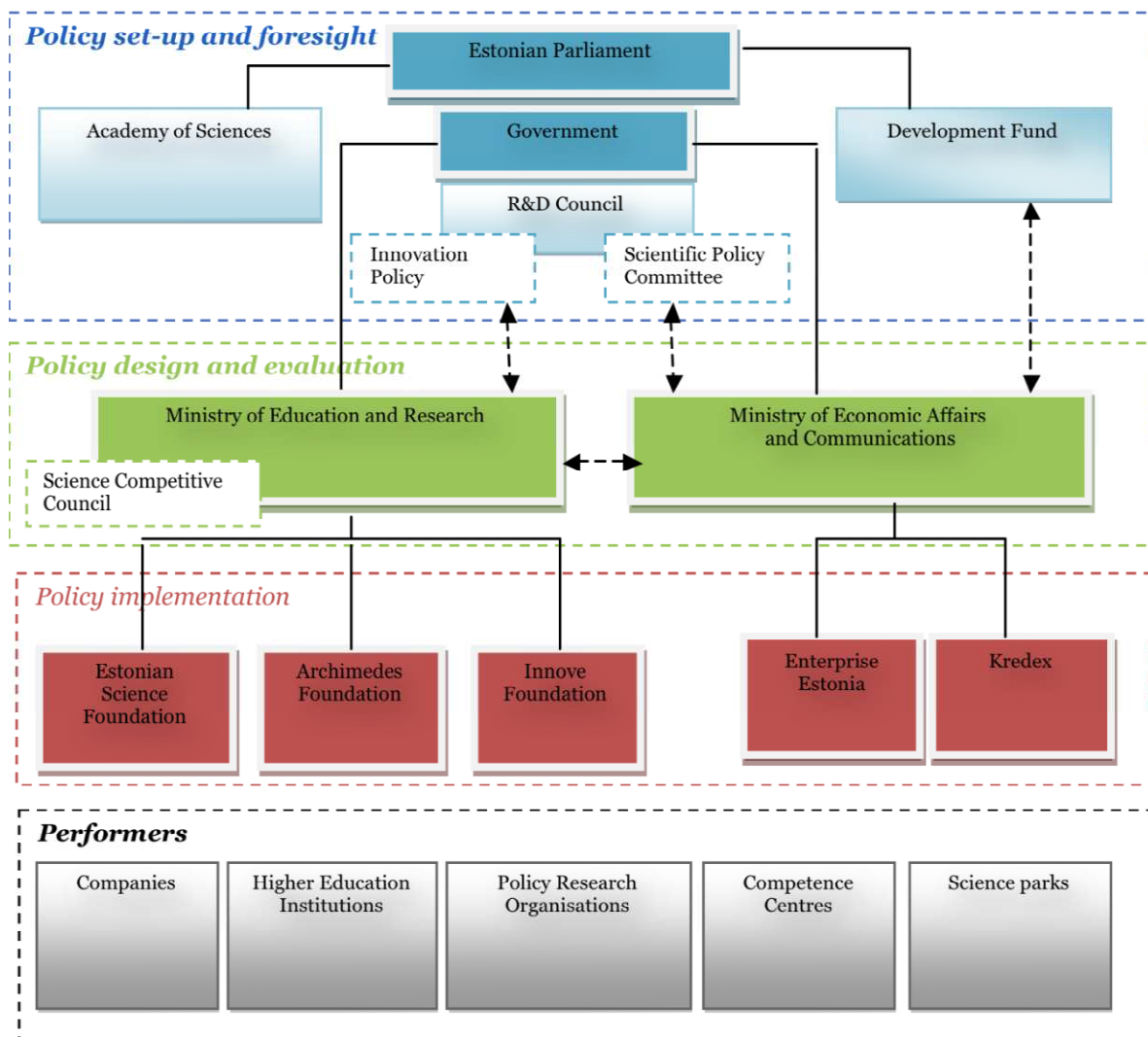
The current innovation management system in Estonia has remained unchanged. It is considered that the roles of the stakeholders are precisely defined and the mutual relations are clear (Picture No 5.3.1.1.).

The main administrative authorities responsible for the development of innovation policy in Estonia are the Ministry of Economics and Communication and the Ministry of Education and Science. The Ministry of Economics and Communications elaborates regulations for attracting and allocating of financing for relevant sectors, whereas the Ministry of Education and Science elaborates regulations related to coordination of research and development and cooperation among other institutions. Both

⁴⁷ Thomas Alslev Christensen, Shaul Freireich, Jana Kolar, Paula Nybergh, "Peer-Review of the Estonian Research and Innovation System Steady Progress Towards Knowledge Society", 2012

⁴⁸ "Country profile: Estonia", 2007; available: http://ec.europa.eu/invest-in-research/pdf/download_en/psi_countryprofile_estonia.pdf

ministries have involved committees which provide consulting on efficient introduction of different policies.⁴⁹



Picture No 5.3.1.1. Process of innovation policy management in Estonia; Source: Ministry of Economics and Communications.

Based on the introduced innovation policy, the afore mentioned ministries are cooperating with agencies which are actively working on application and practical introduction of the policy. For example, „Enterprise Estonia Foundation” is responsible for business support, innovation and new technology programs, and is supporting and promoting business in Estonia in general as well. Whereas the two most important agencies of the Ministry of Education and Science are „Archimedes Foundation” and „Estonia Science Foundation”, the main task of which is to ensure financing for university studies, as well as support in commercialization processes, attraction of cooperation partners and other activities.

⁴⁹ Maastricht Economic and social Research and training centre on Innovation and Technology “INNOVATION UNION SCOREBOARD 2010, 1st February”, 2011

5.3.2. Trends and main challenges of the innovation policy

The Estonian innovation policy is rather general, it does not focus on specific industries or sectors, which would require sustaining of innovations. Being a small country, it needs to increase the number of innovative persons, thus achieving that innovations are encoded into thinking of every Estonian resident. The general application of the innovation policy of Estonia is subject of criticism. The state has been recommended to find specific industries or sectors where to concentrate the resources. Currently the innovation policy is closely related to the EU structural funds and the support thereof, where the main emphasis is put on modernization and transfer of technologies, knowledge and international research initiatives. This financing is also used to support novice enterprises. Main emphasis is put on involvement of new people and motivation to establish new enterprises and create new technologies.

Good results may be achieved in short-term by using comprehensive and general innovation policy, i.e., Estonia has become one of the most rapidly growing innovation follower countries.⁵⁰ Still it requires an innovation policy focused on specific sectors, novice enterprises of advanced technologies in new and progressive fields. Being a small country Estonian innovation policy needs to be elastic enough to be able to change specific focus sectors and use market opportunities when market trends are shifting.

It is clear that the innovation policy of Estonia is at its initial stage and currently the Ministries of Economics and Education of Estonia are working on a new strategy for period of 2014-2020, namely „Estonia 2020”. The objective of the strategy is to eliminate the current problems and implement an adequate innovation policy. The strategy states six priorities for improvement of innovation and business environment:⁵¹

1. *Shaping a policy that promotes long-term growth in the international competitiveness of companies.* The most important aim is to ensure growth of productivity and to improve access to capital for the entrepreneurs;
2. *Creating an environment for bringing foreign direct investments aimed at sectors with greater export potential and higher value added.* One of the most important aspects is to ensure qualified labour force and create a stimulating investment environment, as well as develop the regional municipal infrastructure;
3. *Creating preconditions for increasing the volumes of research and development in the private sector and raising the number and quality of innovation outputs.* The primary challenge is to increase the innovation capacity of the enterprises. The enterprises should enjoy support both from the state and the investors. Cooperation should be established at all levels between the universities and enterprises both on EU, national and regional scale.
4. *The broader use of the potential of the creative industries, ICT and other key technologies for raising the value added of other sectors.* One of the objectives is to develop a specific action plan to support these industries and to encourage innovations in service sector.

⁵⁰ Government of Estonia “National Reform Programme “ESTONIA 2020””, 2012

⁵¹ Enterprise Estonia “ENTERPRISE ESTONIA STRATEGY 2007–2013, 2006

5. *Developing human resources engaged in research and ensuring a future supply of engineers and top-level specialists.* The objective is to increase the number of Ph.D. students and to introduce efficient methods for assessment of education quality, as well as support those science sectors which could have potential direct impact on Estonian economy.
6. *Investing in transport and communication infrastructure.* Being aware of itself as a small country, Estonia understands the need of an efficient transport system, which enables the population to move within a coordinated system. Provision of high-speed internet is important for good quality communication with environment.

5.3.3. Regional innovation policy of Estonia

As a result of contacting the regional municipalities of Estonia, as well as studying different available publications, it was concluded that the implemented strategies, i.e., „Knowledge based Estonia 2007 – 2013” and „Estonia 2020” serve as the guidelines for the common national policy making. Considering that Estonia is a relatively small country, no specific priorities are set for research, development and innovation policies. Different types of regional innovation strategies have been implemented, for example, Tartu region innovation strategies or the Regional innovation strategy of Estonia, which mainly provided political guidelines and recommendations for policy implementation. Currently many of the recommendations contained in these strategies have been implemented and parts of these are under development. R&D infrastructure has been improved, new science and technology parks have been developed, but no attention has been paid to the policy for specific cluster industry program, since it is considered that clusters are one of the main driving forces for regional economic development and are playing a central role.

5.3.4. Internationalization of the innovation policy

Being a small country, it is very important for Estonia to search for international cooperation partners and to ensure technology and knowledge transfer to be able to create new ideas and continue the development of the innovation policy. Estonia is cooperating with different state agencies in United Kingdom, Switzerland, Russia, Japan, as well as Nordic countries. The agency „Enterprise Estonia” has established representative offices both in Europe and USA to promote Estonian enterprises and to assist in finding cooperation partners and potential investors.

„ENTERPRISE ESTONIA”

The agency is operating on behalf of the Ministry of Economics and Communications since 2000, with the main objective of providing support to the enterprises and take care of introduction of innovations and technology programs. The agency is the main authority responsible for allocation of EU structural funds.

The vision of the agency is to achieve that the reputation and business environment of Estonia would be equal to that of the most advanced countries in the world. „Enterprise Estonia” is implementing transparent and efficient programs to support innovations and is improving the management of the

agency itself.⁵² Different conferences and working groups are organized in cooperation with other organizations, for example, to improve the novice enterprise environment. The agency can help new enterprises both by providing consultations and attracting financing, and it plays an important role in different innovation programs, for example, the Biotechnology program of Estonia and the Power technology programs.⁵³ After reviewing and analyzing the activities, objectives and description of the agency, it can be concluded that it is fulfilling similar functions as the Investment and Development Agency of Latvia (LIAA), for example, allocation of EU structural funds, as well as the foreign representative offices of the agency.

One of the programs introduced by the agency at the beginning of 2010 is „Innovation Voucher grant”, which invites the enterprises to cooperate with research institutions and to implement innovative ideas. SMEs may use this program to purchase services for development of products at higher education institutions or to purchase services from the patent board, as well as receive consultations from different competence centres. During a year’s period 149 enterprises had used this service in Estonia.⁵⁴

Other organizations involved in innovation processes in Estonia were mentioned above as well. „Enterprise Estonia” is only one of the activities working on the support and improvement of innovation system. Estonia is also working to establish cooperation with foreign scientists who would transfer their knowledge and improve the current system of Estonia. Education and research programs focused on space research and the related technologies are also being implemented. Development of such technologies in cooperation with the institutes and research agencies of other countries has a crucial role to play.

5.3.5. Efficiency of the innovation policy

During the time period from 2009-2011 there has been no specific evaluation of innovation policy in Estonia. It is known that specific criteria for implementation of innovation policy have been integrated in to the strategy “Knowledge-based Estonia 2007-2013”, yet there has been no specific study of whether these criteria and objectives have been achieved. The available publications review the innovation activities undertaken during the period from 2006-2008, which is outdated information, considering the rapid growth of Estonia. Most of the publications emphasize that Estonian policy makers have adopted the right development course but initiatives for closer cooperation between the academic and the business domains should be improved.⁵⁵

In 2012 a group of experts had evaluated the operation of the innovation system of Estonia, taking the Self-assessment tool [SAT] developed by Innovation Union, consisting of different criteria, as the basis for analysis, i.e., the economic structure and its operational quality in Estonia, as well as

⁵² “THE FLOAT- NEWSLETTER OF THE CENTRAL BALTIC INTERREG IV A PROGRAMME 2007-2013”; June 2012

⁵³ European Commission “Regional policy for smart growth in Europe 2020”, Brussels, 2011;

⁵⁴ Katre Eljas-Taal “Thematic Report 2011 under Specific Contract for the Integration of INNO Policy TrendChart with ERAWATCH”, December 2011.

⁵⁵ Thomas Alslev Christensen, Shaul Freireich, Jana Kolar, Paula Nybergh, “Peer-Review of the Estonian Research and Innovation System Steady Progress Towards Knowledge Society”, 2012

international cooperation in research and innovations. The expert group came to several conclusions which reflect and evaluate the current innovation system and policy in Estonia:⁵⁶

1. The innovation policy implemented by Estonia has ensured the country with stable growth; by learning from the Nordic countries and other EU member states, Estonia has created a successful platform to support future development. Currently Estonia has to adjust the innovation policy to its specific requirements to achieve sustainable development of the country, based on the specific national objectives instead of the general EU practice;
2. The implemented policy has achieved innovation growth in several sectors and the country in general; so far the goal has been to improve the system based on science and new studies, which would have the potential for commercialization. Still it is evident that the biggest contribution to the country is brought by the production industry, which pays only indirect attention to research, development and innovations. The representatives of this industry have to be motivated to improve the production processes, to implement new products and technologies, as well as develop intellectual property.
3. Being a small country, Estonia is greatly lacking qualified labour force, which affects both the development of new companies and the national growth as well. Estonia is developing as a country with its economy rooted in knowledge, therefore human resources and their qualification are playing a crucial role. This aspect is hindering future development of the country, which means that the education system has to be improved and the immigration policy considered as well.

5.3.6. Summary of the innovation policy of Estonia

After studying and analysing the documents that contain information on the innovation policy, its management and trends in Estonia, five main points can be stated:

1. During the last decade Estonia has developed rapidly and improved the national innovation system, thus achieving the investments in R&D equal to the average EU level. The stated target – to invest 3% of the GDP in the innovations by 2020 – seems feasible;
2. The innovation management system is clear to the stakeholders and each organization is aware of its primary duties. Still the government and the administrative authorities are subject to criticism. The reasons for the criticism are mainly the failure to ensure administrative capacity, as well as the intransparent introduction of the policy according to the developed strategies „Knowledge based Estonia 2007 – 2013” and „Estonia 2020”;
3. Due to the small size (population and territorial) Estonia has not introduced the regional innovation policy since the regions have minimum difference in between them to have impact on the whole national policy. Though Estonia has developed the innovation strategies of the regions, which are used as the basis for implementation of region-specific initiatives;
4. The innovation policy in Estonia has been designed as rather comprehensive and general, supporting different initiatives and sectors which has enabled the rapid growth. But the

⁵⁶Kimmo Viljamaa, Henri Lahtinen „Regional Innovation report (East Finland Region)”, 2011

implementation of such policy is not suitable as a long-term solution and the priority sectors should be defined for the purpose of concentrating current resources. Whereas the policy itself should be international and flexible at the same time. The policy should follow global trends and be able to adjust, and it is crucial to ensure involvement of highly qualified people both on national and regional scale;

5. Estonia has done the evaluation of the efficiency of the innovation policy which has enabled the understanding of future requirements for the improvement of the common policy system and the understanding of the current problems. But the policy makers should introduce a systematic process for the evaluation of the innovation policy because it would ensure sustainable improvement.

5.4. Case analysis – trends of the innovation policy of Eastern Finland region

5.4.1. Economic and innovation trends of the region

The Eastern Finland region has faced the greatest number of challenges in the development of the innovation policy and the improvement of the system compared to other Finnish regions. The Eastern Finland region has faced such challenges as unemployment, population migration to other regions and demographic ageing. The economic state of the region is rather poor as well because many enterprises of the region have not managed to overcome the transition from industrial to knowledge-based economy. That, in turn, caused problems with productivity and competitiveness in the global market. The advantage of the Eastern Finland region is the knowledge on processing and use of different natural resources (minerals, wood). It has been emphasized that new and innovative services should be introduced as well.⁵⁷

Considering that the Finnish region is a relatively static unit, specific innovation policy for the development of the region has not been elaborated. The most important innovation policy documents are national level.

Although the region has faced several economic and social challenges, still it can be proud of a high knowledge potential. It is ensured by the major share of the working age population with higher education (45.9 % of the residents at the age of 30-34 years have higher education). 74% of the total Finnish population currently has internet connection available, which is an integral part of knowledge exchange nowadays. Based on the data from 2009, it is clear that the total investments in research and development amounted to 1.69 % of GDP, but, compared to the Western Finland region, the investments in the innovations have exceeded by 44%. During the time period from 2005-2009 the investments in research and development varied from 1.5 % - 1.7 % of GDP.⁵⁸ It demonstrates that the investments lack an increasing trend and partially reflects the innovation problems within the region.

By analysing and reviewing different indicators of the innovation policy and economic activities, it can be concluded that the regional innovation policy has had positive impact on the development of the higher education infrastructure and has reinforced the research and development activity. Whereas

⁵⁷ Eurostat database "Total intramural R expenditure (GERD) by NUTS 2 regions"; Available: 30.08.2012

⁵⁸ Kimmo Viljamaa, Henri Lahtinen „Regional Innovation report (East Finland Region)”, 2011

in the private sector the innovation policy has had a very weak impact, because it has potentially encouraged only a few enterprises to become involved into research and development and innovations.

5.4.2. Management and administration of the innovation policy

The Eastern Finland region has not assigned an organization which would be responsible for the introduction and implementation of the innovation policy. The innovation policy is being developed in cooperation with the regional council, Economic Development Centre, Transport and Environment Centre, as well as other stakeholders, for example, the city councils, universities, technological centres and other agencies, for instance, the Chamber of Industry. It is important to mention that in Finland each sub-region has individually designed economic development policies which include regulations on research, development and innovations as well.

Therefore the municipalities enjoy a relatively great autonomy to draft their budgets, but the majority of the financial aid for the innovations is still provided by ERDF or European Social Fund, as well as national programs. Despite the certain autonomy, the region still has to consider the provisions stated by the government when defining objectives and measures of the innovation policy, although in reality the municipalities may avoid complying with the guidelines of the government.

The strategies developed by the regions are considered superior to the centralized strategies since the regional organizations have a better understanding of the main needs and possibilities. The guidelines of the EU, as well as national and regional strategies are used in the development of the innovation policy. The opinions of the research centres and the involved universities are also taken into account to ensure maximum compliance of the innovation policy and to consider the interests of all stakeholders.

5.4.3. Challenges to the policy makers

One of the main challenges that the region is facing is keeping the educated labour force. It was mentioned at the beginning of the section that one of the advantages of the region is that the majority of the working age population has higher education. This advantage is ensured by the University of Eastern Finland which offers different study programs. There are also four polytechnic institutes that ensure cooperation between the public and the private sectors.

Currently the innovations in the private sectors are on a relatively low level compared to other regions of Finland. It is demonstrated by the fact that there are only few enterprises capable of competing in global markets, and obtaining protection of intellectual property is not a priority activity. It is explained by the fact that enterprises tend to use more natural resources and become involved in agriculture or forestry. To address the problem, the region has designed a strategy stipulating specific sectors to be supported, for example, biomass and wood, renewable energy and

welfare technologies, yet it can be concluded that the defined sectors are general and the resources are not focused.⁵⁹

Research at the University of Eastern Finland is carried out on a high level, ensured by having good competence in such fields as environmental sciences, health, bio-science, nanoscience and material science. Great share of financial resources of the region are invested in research and development of public organizations. Yet the main problem remains that these research centres are relatively small and the most capable research fields are not related to the business activities within the region. Therefore the innovation of the SMEs of the region is on a relatively low level.

The Eastern Finland region is characterized by a low population density and rapid demographic ageing. To address this challenge, innovations are required both in the private and the public sector to enable improvement of welfare and life quality of the elderly population. For example, the municipality of Kainu introduced an innovation policy specifically aimed at taking care of the elderly residents of the municipality by introducing new services and innovative solutions. There have been several initiatives developed to improve the current services and to design new ones.

5.4.4. Perspective solutions for the innovation policy

Although the innovation policy is fragmented in the Eastern Finland region, it is still being actively used for the last 10-15 years. The innovation policy is closely linked to the regional policy and structural funds similar as in other regions. It demonstrates that the research infrastructure is less developed than in other regions and that the private sector is allocating less resources for the research and development.

The smaller regional units in Eastern Finland have tried to design a common policy based on innovations, but the administrative structure is still fragmented, involving different stakeholders. Specific local problems can be solved by using EU funding, but no specialized solutions are designed for the given region.

The study stipulates that it requires such innovation policy that would specifically define some sectors to be supported (for example, bioenergy, medicine, environmental sciences) with the highest potential, which could then find their niche in the global market and simultaneously address the social challenges (demographic ageing, climate changes, etc.).

⁵⁹ Patrik Laxell "The Innovation Strategy of Eastern Finland", 2007

5.5. Case analysis – analysis of the action plan and strategy of Skane region

5.5.1. Analysis of the action plan for innovation development 2009-2012 of Skane region in Southern Sweden

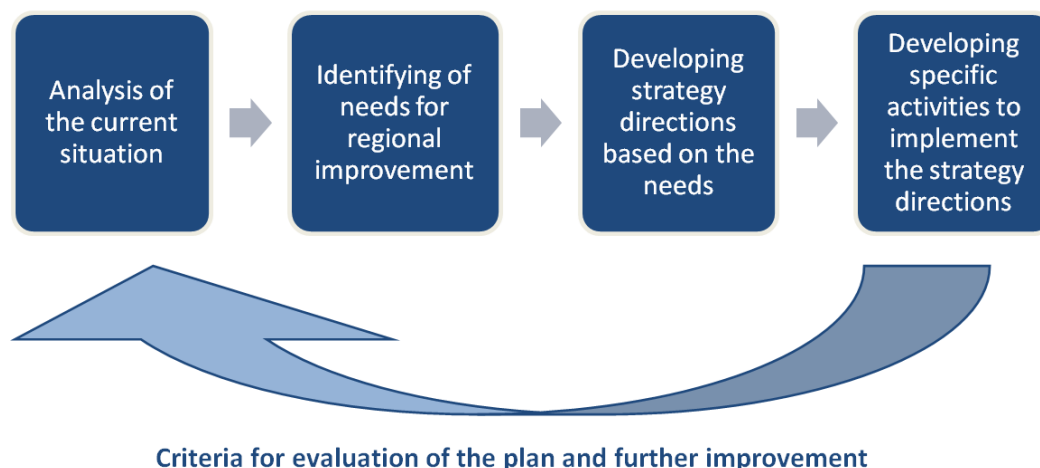
While analysing the action plan developed by Skane region, it can be concluded that its purpose is to restructure the innovation policy, to broaden the vision of the region and to plan the potential development scenarios. It is evident that future technologies and new and innovative products can be created through cooperation of policy makers, entrepreneurs, universities and other stakeholders. The action plan includes both general and specific measures to be implemented. Although the plan is intended for a three year period, its authors emphasize that the assessment and analysis of the implemented changes require at least ten years.

Reasons for development and implementation of the innovation action plan

Development and successful implementation of the innovation policy is not only the main priority of Sweden, but that of all EU, in order to continue successful development in the future as well. Currently the innovation policy of Sweden puts emphasis on the optimization of the common system with the objective of choosing specific sectors to be supported, to create a cluster and to attract financing specifically for these priority sectors. If this kind of development is continued, there is a great chance that new industries or products would go unnoticed therefore a new platform for the innovation policy is required.

The innovation policy makers have a great challenge to create a policy which would be adjusted to the regional needs but also would be closely related to the national policy and the EU programs and initiatives. The situation serves as a proof that development of the innovation policy is a complicated process since it involves both public authorities and the entrepreneurs from different sectors and structures. A common policy platform is required which would enable the stakeholders to interact and to create new technology sectors.

The innovation system of Skane region includes inventors and research organizations, manufacturers and service providers, as well as users and customers. The innovation system creates added value through mutual communication by new developed products, services and processes (innovation climate). Whereas different support methods stimulate the processes to transform a specific idea into the actual product or service (Innovation support structure). The innovation policy has to be focused on the establishment of communications and relations between the stakeholders of the system, improving the innovation climate and innovation support structures. Skane region developed the action plan with the purpose of implementing the innovation system. After reviewing the action plan, it can be concluded that a structured approach to problem solving as well as assessment was adopted. The summary of the approach is displayed in the picture No 5.5.1.1.



Picture No 5.5.1.1. Structure of the development of the innovation action plan for Skane region

Action plan

Analysis of the current situation

Before developing definite solutions, the current situation and the specific challenges should be understood. The authors of the action plan assessed the innovation development of Sweden and Skane region by using the EU studies and indices (for example, the European Innovation Scoreboard index), as well as evaluated the implemented innovation infrastructure in the form of universities, enterprises and public institutions. Such criteria as the willingness of the able-bodied population to do business, the availability of financing and investments, different aid tools in form of grants and expert consulting were reviewed as well. Of course, cooperation of Skane with other regions both in Sweden and abroad was essential as well.

Development needs in Skane region

Based on the analysis of the current situation, specific questions were posed to understand the strengths and the weaknesses of the innovation system of Skane region. the conclusions were made on the grounds of the following activities and documents:

1. A group of professionals was formed representing Skane region, universities, the innovation program VINNOVA. Consultants specialized particularly in innovation issues were involved as well;
2. Different direct and sub-functions of the innovations were assessed, analyzed and described. The results were obtained by interviewing organizations which were involved in encouraging of innovations and introducing specific legislative platforms. The main objective stated was to understand the abilities and functions of the innovation system;
3. The ability of the regional innovation system to create a network, which would encourage development of high added value products, was assessed by using a specific method;
4. All documents elaborated at the working group meetings and other meetings were used to analyze the situation and to draw conclusions;

5. The analysis of the current situation was based on the following aspects – innovation environment in the region, stakeholders, their roles, functions and direct involvement in support of innovations and business.

The obtained materials were used to understand the needs and the specific development courses for Skane region:

- ❖ The need to develop specific skills. The innovation system of Skane region was analyzed and the strengths and the weaknesses were identified; a list with skills required for future development of the region was composed based on the weaknesses;
- ❖ Introduction of systematic management. The cooperation and the cooperation models ensuring wholesome development of the innovation system have to be improved. It was also emphasized that globalization creates additional challenges to the successful introduction of innovation policy platform;
- ❖ Support structures for the service innovations have to be improved. Skane region is still putting more emphasis on the technology research and development. Whereas the innovations in the service field are less important, therefore these sectors should be supported;
- ❖ Increased support for innovations in public sector. Cooperation between the public and the private sector is needed to encourage innovations in public institutions, for example, cooperation between the pharmacy sector and the state health care;
- ❖ Methods to support innovation processes in the existing companies should be developed. Currently the majority of Skane enterprises are involved in production and administration of the existing processes, therefore the region has difficulties being innovative because the enterprises do not pay attention to innovations. An agency ensuring knowledge exchange between the industry and the academy has been established, thus increasing the number of the commercialized university studies. Although the Innovation support organizations can support and persuade the research institutions and the universities to commercialize the studies, it is difficult to persuade the existing enterprises to implement innovative solutions. The main reasons for the lack of communication between the stakeholders are the ambiguous goals of the universities, as well as the incompatibility of the technology institutes with the business environment and needs. The state innovation support institutions are mainly focusing on individual, new entrepreneurs, instead of trying to support the existing enterprises;
- ❖ The competitiveness is based on the need for internationalization. More emphasis should be on research and development on global scale, to create an environment where other market actors would be interested to cooperate;
- ❖ Information for the enterprises and creation of the collective opinion. A system should be created, an organization where the professionals could follow the trends in the global markets and establish contacts with other enterprises and regions on systematic basis.
- ❖ Resource concentration and setting of priorities. Since in global terms the region is small, the resources should be concentrated and the most important sectors should be supported. The enterprises should compete among themselves as little as possible specifically within the regional boundaries, but instead should cooperate more with each other. Financing should comprise a

sufficiently large number of sectors, but simultaneously should be adequate for each of the sectors.

- ❖ Support for innovation companies under growth stage. The majority of the innovations are capable of self-development, but they cannot enter the next level of development, i.e., to enter new markets, to increase the capital and to become more internationalized. Support is also lacking for searching and improvement of new technologies in order to continue establishing new enterprises;
- ❖ Transparency and coordination. The system is not clear and does not provide an easy overview to the entrepreneur because there are several stakeholder that are not able to communicate among themselves and their functions overlap as well. The analysis of the situation has demonstrated that the supporting organizations understand the emerged problem and are trying to address it;
- ❖ Evaluation criteria and monitoring. Policy makers in Skane region emphasize that long-term financing opportunities should be created for the organizations, because performing specific activities in long-term (instead of the commencement of the project until the specific final stage of the project) would provide a lot more efficient results. Secondly, although different statistics for the evaluation of the innovation system is easily available in Sweden, still there no elaboration specific and qualitative indicators have been elaborated or used on systematic basis. There are few studies comparing different regions both on international and national level as well;
- ❖ To make the region more attractive. Despite the fact that the region ensures a relatively good business environment, it needs to consider satisfactory living conditions as well in order to recruit both national and international experts who would form a creative environment and continue developing innovations;
- ❖ Cooperation platforms should be developed and strengthened. The innovation system still has a relatively large gap between different industries and sectors, which should be connected. These gaps potentially hide unnoticed possibilities of new innovations. Cooperation should be established at all levels with other Swedish regions and the Baltic countries as well;
- ❖ Necessity to strengthen the creative capital. It is being considered that currently the main resource is the creativity of people and the wish to create new solutions. The improvement of the innovation infrastructure should be continued and new clusters should be created, which would enable recruiting more creative people and improving the current innovation system;
- ❖ Strengthening of new enterprises. It is difficult to predict which industries will be the most profitable in the future but it is considered that new and innovative services will be playing an increasing role.

Based on the above mentioned needs, seven strategic basic courses were developed for improvement of the common innovation system and policy to strengthen the innovation system in Skane region. The seven strategic initiatives were supplemented with specific activities to implement the strategy. Specific activities, undertaken by the region to implement the strategic initiatives, were analysed and reviewed.

1. To develop a systematic management

For the purpose of developing the systematic management Skane region was planning to perform five specific activities within the period from 2009-2012:

- 1.1.To define a common future vision and feasible objectives. The future vision was developed at the early stage of the project because it served as the basis for sustainable future development and further advancement of all stakeholders. In order to evaluate the achievements, criteria were defined that were not mentioned in the action plan;
- 1.2.Three functions were introduced which inter-communicated on regular basis and ensured systematic management:
 - 1.2.1.Management committee (creates pre-conditions for cooperation of other groups);
 - 1.2.2.Cluster management and function of other specific operations;
 - 1.2.3.State subsidized agency and private sector (executors).
- 1.3.To systemize the obtained experienced and to strengthen different skills within organizations. This was intended to be achieved by organizing different forums and seminars to share experience, to obtain new knowledge and to improve the innovation system;
- 1.4.To introduce training on innovations and processes. The innovation policy is one the of the business and research policies but is not defined specifically. Both the population of the region and the politicians should be communicated and educated to ensure success of results;
- 1.5.To develop supervision and evaluation methods with the purpose of improving the common management system. There have been different quantitative methods introduced to evaluate, for example, the operation of clusters. Qualitative methods should be introduced as well to allow evaluating the relations between the stakeholders within the system. Comparison with other regions should be undertaken as well to evaluate the compliance of the adopted course with the global trends.

2. To strengthen the formation of the collective opinion

For the purpose of strengthening the collective opinion Skane region stated three basic activities to be implemented with the intent of improving the current system.

- 2.1.To develop a specific function which would be responsible for systematization and summarization of information related to business (for example, analysis of competitors or market). The system will be improved and strengthening as well as made more efficient by introducing one specific organization;
- 2.2.To develop forecasts for specific industries and regions in general to enable identification of expected challenges and potential development courses which could change the future development of Skane region;
- 2.3.To develop a regional information centre, which would gather specific information on challenges and trends in the global market. The obtained information would be transformed into specific visions and strategies. The centre would serve as the basis and physical site for ensuring of systematic management.

3. A more comprehensive approach to innovations

In order to create a wholesome innovation system in the whole region, absolutely all stakeholders, entrepreneurs of any industry, public sector and residents of the region of any age have to be involved. A comprehensive approach to innovations will be achieved by implanting the following five items:

- 3.1. To develop the availability of support for innovation particularly in the service field. There are several incubators and initiatives which support the service field in particular. It has been emphasized that the communication and knowledge exchange among different initiatives has to be improved;
- 3.2. To involve users of the products and technologies in creation of new innovations. The obtained information on the user recommendations could be divided among different projects and working groups. Distribution of knowledge could be ensured this way;
- 3.3. More support should be provided to the innovations in the public sector where the public organizations should be encouraged to cooperate with entrepreneurs, developing new services or promoting export growth;
- 3.4. To develop support for new industries within the region, i.e., to invest into unconventional industries, for example, cinema, media or video game industries. Specific investment funds should be established to provide exclusive support to creative industries;
- 3.5. More support should be provided to such innovations which have been stimulated by the market. Skane region has already implemented several activities with the purpose of connecting the enterprises with the available labour force qualification and to increase the innovations in the existing enterprises.

4. To strengthen and improve the current innovation support structures

The work done with the innovation system has proved that system improvements are required currently, which can be implemented through the nine main activities:

- 4.1. To develop the prospecting function. To create a regional initiative which would be dealing with the prospecting of market trends and technologies and this information would be available both to the private and the public sectors;
- 4.2. To develop and specify the roles in the supporting structures. A study was carried out on all the organizations involved in the innovation system in Skane region. The conclusions demonstrated that communication is lacking among the 51 organizations and agencies, which results in overlapping of the functions and inefficient operation of the system;
- 4.3. To develop a common information platform in the internet. Skane region is working on a common internet site to provide information on innovation support measures in the region to both the public and the private sectors;
- 4.4. To encourage education among agencies and organizations. Education should be strengthened by encouraging different seminars, working groups, as well as by comparing and evaluating their current operation;

- 4.5.To develop knowledge on new sectors. Knowledge on new sectors should be improved; emphasis is put on such industries as entertainment and service sectors. The innovation system support organizations should undertake research activities as well as comparative studies;
- 4.6.To reinforce the system perspective. A common strategy to ensure perspective for the development of the region has to be elaborated together with the main sponsors of the region;
- 4.7.To strengthen the development of the research. Since Skane does not have any research institute, a link should be created between the business and the research. Currently the region is working on the introduction of a research institute and cooperation with the universities of other regions;
- 4.8.To strengthen the “third flow activities”. The region has to develop promotional methods to encourage the university and institute researchers to get additional income and to commercialize their studies;
- 4.9.To strengthen the resolution of the industrial enterprises. A set of several activities would be required to encourage the industrial enterprises to get involved into solving of the innovation problems in the regions. It is important to recruit industry representatives, based on their terms of participation.

5. To identify and eliminate the shortages

For the region to be able to develop and improve, the main shortages of it should be understood and efforts paid to eliminate these.

- 5.1.To identify the shortages. In order to be competitive in different industries, the market actors have to join to create new services and products together;
- 5.2.To understand what activities should be introduced to eliminate the shortages. Synergy should be created among different sectors and regions. It means that the talents and the specific knowledge of any stakeholder have to be used;
- 5.3.To develop a method for eliminating the shortages. There have been certain initiatives developed which will enable more efficient elimination of defects.

6. Being international will help to strengthen the regional innovation system.

The globalization is forcing the regions to operate on international level because that is the only way to ensure competitiveness and development. Therefore Skane region implemented three activities for this purpose:

- 6.1.To strengthen cooperation with Oresund region in Denmark. This region has also developed an innovation strategy and is interested in cooperating with other regions since it has a great understanding of the problems and challenges of globalization;
- 6.2.To strengthen the internationalization within regional clusters. The internationalization within clusters should be stated as the basic objective, attracting foreign companies and implementing other activities;

6.3.To strengthen international cooperation in the regional research sector. The research institutes and universities have many international contacts and cooperation but more emphasis should be put on it by recruiting entrepreneurs.

7. To improve and support the creative and innovative environment

There is an opinion in the region that the creativity of the population and the community is the pre-condition for a sustainable development:

7.1. Initiatives should be developed to attract and strengthen the creative capital of the region which shall be achieved by organizing different seminars in the region. Cases from Great Britain were considered too and the implementation of the process explored.

7.2. Identification of the perspective innovation environment and understanding of the trends is the pre-condition for future development and improvement of the region.

5.5.2. Analysis of the innovation strategy 2012 - 2020 of the Skane region of Southern Sweden

Skane region performed a comprehensive analysis and research among specialists of different fields, research centres and universities which enabled the development of the innovation strategy of the region. The vision of the strategy intends that Skane region will be one of the most innovative regions in Europe by 2020. After analysing the developed strategy, six perspectives were identified, where a specific action plan was prepared for each of the perspectives.

1. To develop a systematic management

For the purpose of strengthening the innovation capacity, systematic management has to be introduced in Skane region, which is one of the main priorities in the innovation strategy for the next planning period. It has been emphasized that a common management system should be created, precisely defining the objectives for common work on regional development. Skane Innovation and Research Council and Skane Innovation Board were established as the first management element. For the purpose of implementing this strategic objective, an open, transparent systematic management able to precisely perform the tasks at hand (for example, the analysis of market trends) is required.

2. To encourage understanding of innovations and to involve more representatives of the community

For the purpose of creating a strong innovation basis, all representatives of the community should be involved and their understanding of the innovations should be encouraged. Different stakeholders involved in the innovation proves should be united to encourage and act with the aim of achieving common growth. The mentioned activities should be undertaken in the whole region of Southern Sweden. Encouragement of new operational methods both in the public and in the private sectors, i.e., the social innovations and the innovations in the creative industries and the service sector shall be integral part of it.

3. To rationalize and to optimize the innovation support systems

By supporting an open policy and transparency of all available resources, the region will be able to strengthen all stakeholders which provide financial support. Control of the financing should be developed where necessary. The management is prepared to continue implementing new activity types and change the existing ones, as well as pose constant challenge and question the developed structures to enable improvement. Support and conditions for the entrepreneurs should be improved to enable them to have success at the market and to implement new technologies and products. This is one of the most important aspects to enable implementation of the developed strategy.

4. To develop new innovative sectors and creative environment

To reinforce the ability to recognize and develop new innovation sectors is one of the main success factors to improve innovation capacity and innovation system in Skane region. There is a great potential for achieving the stated objectives as the region has several strengths. Industries from different fields including most diverse knowledge are represented. The region is working on introducing specific systems and policies to be able to establish a more creative environment and to connect other initiatives which could improve each other.

5. To develop the international cooperation

Growth in the global market requires strengthening of the international competitiveness. The universities, the enterprises and the public institutions have to design solutions which would allow complete competitiveness in the international arena. One of the most important aspects is to recruit the specialists from different regions of the world, therefore the capacity of knowledge has to be complemented by the best specialists of the world. It is important to develop an international contact network which would enable creating of an open innovation platform and strategic alliances both with the industry representatives and other regions. Today access to information is unlimited and at the same time unstructured, so therefore a platform is required which would provide the possibility to share the resources and the obtained knowledge.

6. To strengthen the innovation capacity in the existing industries and the public sector

Sweden has traditionally supported cooperation between the industry and the academy in such sectors as pharmacy, car industry and telecommunications. The form of cooperation of different parties is under constant development and improvement, thus enabling the increase of efficiency and the design of new technologies. Small and medium enterprises in particular have to cooperate more actively with the technology institutes to improve the innovation capacity. Innovation policy supporting the cross-sector cooperation and improving the relations between enterprises and universities is required. It is also emphasized that the innovations are not just created from new knowledge, but the innovation can be created by using the existing knowledge. Therefore the application of the existing and the new knowledge has to be stimulated among the big companies and SMEs in particular. It was also acknowledged as a problem that SMEs are lacking knowledge in sales and marketing which would allow entering new markets.

5.5.3. Observations from the analysis of the action plan for 2009-2012 and the strategy for 2012-2020 of Skane region

The content of both documents, which have been made with a two year interval, namely, the action plan was published in 2009 and the strategy for 2012-2020 was published in 2011, was analyzed and reviewed. Considering that the time period between both documents is relatively short, it can be concluded that the problems and challenges in both documents differ marginally.

After reviewing the documents it is evident that the problems identified in 2009 still exist in 2012 as well and these are intended to be solved by 2020. The strategy of Skane region for 2012-2020 shows that the region has implemented different activities stated in the action plan of 2009, for example, such functions as Innovation and Research Council and Skane Innovation Board were introduced to implement the systematic management. Introduction of these structures proves that Skane region is following the developed plan but it is clear that all activities stated in the 2009 action plan were not implemented, therefore these have been included in the next planning period.

It can be concluded that implementation of efficient innovation policy platform is a time-intensive and complicated process due to the high number of stakeholders, industries etc., as well as considering the high level of challenge complexity. If Skane region succeeds to implement the action plan developed in 2009 and improved in 2012 by 2020, then it can be considered that the work on the strategy development will have been successful.

6. Profile of Latvia-Lithuania border region

6.1. Resource analysis

The research and technology development strategy of the border region is based on the efficient use of the current resources of the region and introduction of new and complementing resources and mechanisms within the framework of the national planning documents and the innovation policy of European Union (picture 6.1.1.).



Picture 6.1.1. Structure of the research and technology development strategy.

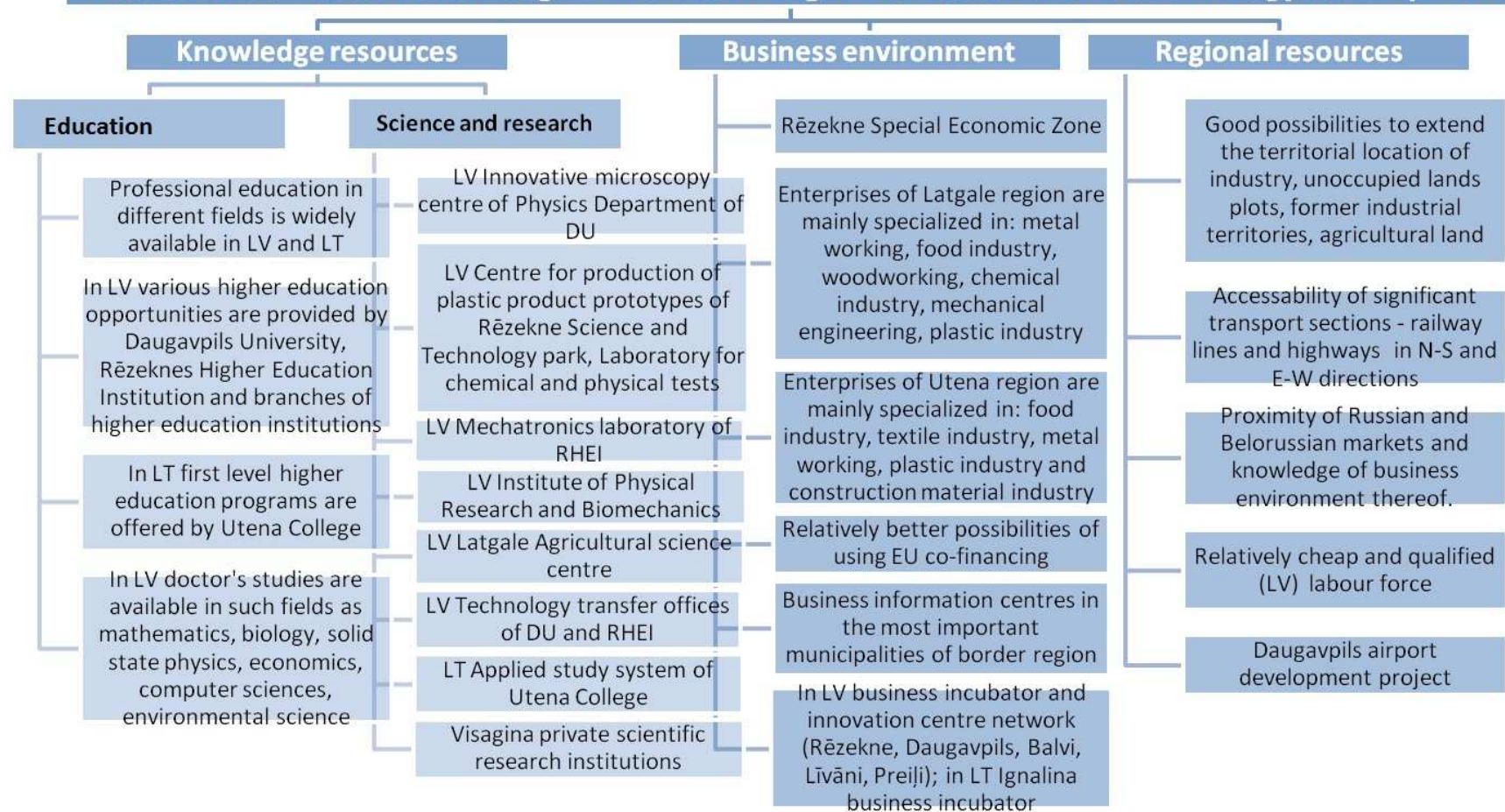
The most essential resources of Latgale region and Lithuania border region, that form the basis of research and technology development, are displayed in the picture No 6.1.1.1.

6.1.1. Knowledge resources

Considering the specifics of the border region, where educational and research institutions are mainly concentrated in the biggest cities of Latgale region – Daugavpils and Rēzekne, these cities in particular have a significant potential to become the research and innovation centres of the border region both by cooperating with Latvian and Lithuanian entrepreneurs and by developing their research capacity in the international arena. The cities are more suitable for innovations and large scale economic activities, they can perform the role of the economic activity growth centre or service provider centre better than the rural populated areas.⁶⁰

⁶⁰ SIA "Konsorts", SIA "Konsultanti", Study of business environment of Daugavpils and Krāslava regions, 2011

Most essential resources of Latgale and Utena region for research and technology development



Picture 6.1.1.1. Most essential resources of the border region for research and technology development

Daugavpils provides the possibility to develop applied and fundamental research using the existing research basis in the following technological fields:

- ❖ biology (Ecology Institute of the Faculty of Natural Sciences and Mathematics of Daugavpils University, Institute of Systematic Biology of Daugavpils University, G. Libert's Innovative Microscopy Institute of Daugavpils University);
- ❖ environmental science and ecology (Ecology Institute of the Faculty of Natural Sciences and Mathematics of Daugavpils University);
- ❖ environment technologies (G. Libert's Innovative Microscopy Institute of Daugavpils University);
- ❖ nano-technologies (G. Libert's Innovative Microscopy Institute of Daugavpils University);
- ❖ physics (Daugavpils University);

Whereas Rēzekne offers the resources of Rēzekne Higher Education Institution and the private resources for research in the following technological fields:

- ❖ laser physics (Institute of Physical Research and Biomechanics);
- ❖ energy (Institute of Physical Research and Biomechanics);
- ❖ optical science (Institute of Physical Research and Biomechanics);
- ❖ mechatronics (Rēzekne Higher Education Institution and Latgale Machinery and Technology centre);
- ❖ environment engineering (Rēzekne Higher Education Institution);

Research resources for agricultural studies, provided by the Latgale Agricultural science centre, are available in Viļāni, Latgale region.

The private scientific institutions in Visagina have the resources to develop research in:

- ❖ material sciences (metal) (DEKRA Industrial);
- ❖ environment technologies (Modernios E-Technologijos);
- ❖ energy (Modernios E-Technologijos);

The technology transfer offices of Daugavpils University and Rēzekne Higher Education Institutions may serve as the basis for commercialization of the research results and ensure cooperation between the higher education institution and the scientific institutions.

Research resources in social sciences are available both in Latgale and Utena region, providing the possibility to conduct applied studies for business needs, and the Utena College has developed a corresponding cooperation mechanism.

Daugavpils University and Rēzekne Higher Education Institution conduct studies in humanitarian sciences, latgalistics and culture related fields, which can serve as the basis for successful development of creative industries.

6.1.2. Business environment

The cross-border regions have traditionally concentrated enterprises working in medium and low technology industries (metal working, machinery, chemical industry, textile industry, food industry), therefore development of new products and technologies in the business environment mostly takes place in these sectors. In addition to the traditional enterprises and sectors, companies have emerged in the region that produce specific products, for example, electronic tools, equipment and machinery, synthetic fibres, plastic products, actively introducing and accepting innovations. Enterprises directly involved in scientific and research are growing in Rēzekne and Visagina.

The technology development and research in the enterprises of the cross-border region is mainly an internal process, by adopting the production practice from holding companies or following client demand. Active cooperation with scientific institutions has not taken place so far.

After reviewing the structure of the existing enterprises, the available research resources in the cross-border region and the development documents of the region, as well as the European and global trends, the following can be identified as the most essential, perspective sectors for technology development in Latgale and Lithuania border region:

- ❖ metal working, metal industry;
- ❖ plastic industry;
- ❖ sectors related to environment technologies and renewable energy resources;
- ❖ production of different equipment, electronic tools;
- ❖ food industry;
- ❖ textile industry;
- ❖ specific niche sectors producing innovative and technological products.

The above mentioned sectors provide great possibilities for cooperation both among the enterprises on local and cross-border level and by involving scientific and research institutions to conduct studies for business needs.

Support for the business start-up and the existing enterprises is provided by different support structures, business incubators (in the biggest cities of Latgale and in Visagina), business information centres, as well as Rēzekne technology park, thus ensuring a basic environment favourable for commencement of various business activities. Availability of EU financing for business is also an important factor, which provides certain advantages to Latgale region and Lithuania border region in comparison to other regions in Latvia and Lithuania, considering the growth results.

6.1.3. Resources of cross-border regions

Both the geographic location and the available infrastructure of the region, as well as allowances in financing serve as positive factors for business development in the cross-border region. Land resources for business development are available in Latgale region and Lithuania border region both next to the cities and in form of agricultural lands in periphery. The infrastructure of the former industrial territories is still available in Latgale as the historical industrial centre.

The geographic location and the road and railway infrastructure is particularly favourable for business development in Daugavpils and also Rēzeknē. The highways, which connect the East to West and the North to South, the available railway infrastructure and the potential for the development of the regional airport in Daugavpils are essential factors for the industrial and logistics enterprises. The proximity to Russia and Belorussia in the cross-border region opens possibilities for new markets.

The provision of human resources differs on each side of the border. Although the labour force is relatively cheap compared to the general indicators of Latvia and Lithuania, the emigration of the residents creates risk of insufficient labour force. At the moment the labour force in Latgale can be rated as sufficient and corresponding to the market demands, whereas the Lithuania border region is already facing the lack of human resources both in terms of quantity and qualification.

In general Latgale region has a higher potential of resources for the development of technological enterprises as Lithuania border region, providing better possibilities to develop various business activities and to continue developing industrial centres in Daugavpils, Rēzeknē, Līvāni and other administrative centres. Whereas the essential resource basis of Lithuania border region is formed by the nature park, which is favourable for tourism development, therefore imposing restrictions to the development of some business sectors. Visagina is positioning itself as the potential industrial city in Lithuania border region the same as Utena in the whole Utena region. The specifics of Lithuania border region is also determined by the former Ignalina nuclear station and the Visagina nuclear station project which ensures presence of nuclear energy related technologies in the region.

6.2. Analysis of possibilities and needs of research and technology development

6.2.1. External conditions for business activity in the region

Development of research and technologies depends on different external conditions which determine concentration of educational and research, as well as business resources in a certain place. For the scientific and research results to be usable in development of new products and technologies, favourable external conditions should be created to improve society's understanding of innovations and science, which would encourage establishment and development of enterprises as well as ensure concentration of the most talented scientists and researchers. The necessity to create environment favourable for research and innovations has been emphasized both in the Sustainable development strategy of Latvia 2030 and Development strategy of Lithuania 2030.

One of the most essential aspects both on regional and national level, serving as basis for new ideas, new technologies and solutions, as well as encouraging involvement of the population in creation of new ideas, science and research, is the general understanding of creativity, the ability to "see" new ideas and their potential practical application. Developing of the creative thinking and understanding in the society promotes formation of new enterprises to implement the ideas, as well as encourages the interest of young people and students about science and research. Creative society is one of the priorities in the planning documents of national and regional scale. As the stakeholders involved in the development of research and technology strategy, the border region is characterized by passivity

of the population; the low business activity indicates of the lack of creative ideas. More than 25% of the interviewed enterprises mentioned a good business idea being the basis of business start-up, and the results of the focus group of scientific institutions demonstrate the necessity of a good idea to enable starting in business. Good ideas are born in a creative environment, which allows initiating of ideas and assessing their compliance and efficiency.

In order to ensure capitalization of the research results as well as encourage introduction of technologies in the border region, general business development and high business activity are required. Innovative and technology oriented new enterprises as well as the diversification of the current production of the enterprises and application of new technological solutions works as an essential factor and foundation for research development, by attracting private resources to finance research and technology development. The participants of idea idejuTalka and focus group also identified business development as one of the most important aspects of promoting research. It was emphasized that the support both for the start-up of business and for operation and development of enterprises in the cross-border region has to be ensured. The Europe 2020 strategy also states the necessity to ensure conditions for innovative SMEs at the regional level. As the enterprise survey results show, the availability of the financial support in particular has served as a significant incentive for introducing new products and technologies in the enterprises. Whereas the operation of structures supporting business incubators and business, as well as the supporting measures undertaken by the municipalities have encouraged establishment of new enterprises in Latgale and Lithuania border regions.

In order to follow global trends oriented towards development of high-tech enterprises, the traditional business range should be complemented by new, innovative enterprises providing support to the existing traditional sectors, as well as operating in the perspective future fields, creating and offering new products and technologies in the market. The region has to create a balance between the traditional industrial enterprises and innovative high-tech enterprises. The operation of the traditional industrial enterprises ensures immediate jobs and stable economic results of the region, while the innovative enterprises create foundations and pre-conditions for sustainable development and growth potential of the region adjusted to global trends.

Another of the most essential external environment conditions for the development of innovations and technologies is adequate public infrastructure. Adequacy of the public infrastructure is one of the most essential factors for general development of the region by promoting business, developing transit, ensuring the mobility of human resources and creating the image of the region in general. The regions of Latgale and Utena have historically been important transit and industrial centres with roads crossing, connecting Europe with Russia and Belorussia; the region has a well developed railway network, creating transport corridors in East-West and South-North directions, as well as industrial enterprises. In order to use these geographical and historical advantages to full extent, the quality of the technical infrastructure should be improved, which is acknowledged by the enterprises surveyed.

The general image and awareness of the region is an essential factor for promoting the interest of the entrepreneurs and potential investors. While encouraging the development of research and

technologies, the region has to be attractive as a business centre, has to recruit qualified human resources, thus ensuring a qualitative living environment, and has to stimulate research excellence. A positive regional image is important, as well as the image of the regional municipalities both in Latvia and Lithuania.

6.2.2. Operation of scientific and research institutions

The higher education institutions located in the biggest cities of Latgale cross-border region – Daugavpils and Rēzekne – lay foundation for research and scientific activities, which are complemented by several private scientific institutions on both sides of the border. Latgale region has a substantial research base in such fields as mechatronics, laser physics, energy, optical science, research of physical and chemical characteristics of materials, environmental technologies etc. and there have been first technology transfer offices established. Whereas the Utena College has developed the system for individual application of applied studies according to business needs. As the results of the interviews with enterprises and scientific institutions demonstrate, practical application and commercialization are limited, which is reinforced by the lack of information on the activities performed by the research institutions and the general lack of business initiative.

In order to ensure efficient use and protection of research results, technology transfer offices can be used as an important tool, connecting the scientific institutions and the operational results thereof with the entrepreneurs and other stakeholders. In long-term perspective the technology transfer mechanisms can identify, classify and rate the potential of commercializing the intellectual property of the relevant studies on global and regional scale. The technology transfer offices, that are operating under the wing of Daugavpils University and Rēzekne Higher Education Institution, lack experience and capacity to ensure an efficient commercialization process. The technology transfer offices should be operating as ideas banks offering patented research results for the business development in the market and ensuring the operation of legal protection and commercialization mechanisms at the same time.

Business skills and knowledge of business processes among students and scientific staff of different fields improve the understanding of the researchers and scientists about different market operation mechanisms and promote conduct of market-oriented studies and thus also the possibilities for result capitalization. Inter-sector cooperation also serves as an essential catalyst of innovation research and business ideas. Currently there are no mechanisms for stimulating business activity among the students and the scientific staff in the higher education institutions of the cross-border region and several events are implemented in the form of projects.

As the interviews with the scientific institutions demonstrate, currently the use of the research results in business is limited, which is affected both by the economic situation and the lack of interest from the regional enterprises. Still as the opinions of the idejuTalka and focus group participants and the development planning documents indicate, the development of innovative SMEs in the region is necessary to encourage creation of products with higher added value both in the existing sectors, their collateral branches and the completely new sectors. As the participants of idejuTalka and focus group admitted, business establishment is a significant factor for economic growth of the region and

preserving of human resources in the region. considering that the biggest enterprises of the region mainly use the internal research resources and those of parental companies, it is particularly important to support development of SMEs, which might use the achievements of scientific and research institutions in their operation.

One of the possibilities for development of scientific and research institutions is provision of research and development services to foreign entrepreneurs. The capacity of the regional enterprises for using the research services and results is limited. At the same time increasingly more enterprises move their research and development departments to countries with relatively lower costs of these services and adequate research quality for the purpose of reducing research costs. As the representatives of the scientific institutions admitted, the current capacity is sufficient to ensure conduct of applied studies for business needs in the relevant fields.

6.2.3. Research and innovations in enterprises

A significant research and development course, currently underrepresented in the cross-border region, is market-oriented research conducted on the basis of market trends and the needs of the clients – entrepreneurs and municipal sector. As the results of the interviews show, cooperation between the entrepreneurs and the scientific institutions of the cross-border region is virtually non-existent. The participants of the focus group and the idejuTalka also emphasize mutual lack of information on cooperation possibilities. Research for client needs ensures direct commercialization of research results and allows developing of new products and services based on the results of adjusted applied studies, thus ensuring access to the most advanced achievements of the sector.

One of the most outstanding problems of science and research, that has been announced in the public, is the financing mechanism which is not oriented towards research results, therefore the scientific and research results are not always practically applicable in the business or public sector. There is a lack of financing for applied studies for business needs, while creating innovation basis for the development of business.

Majority of the idejuTalka participants consider that only highly qualified scientists and research institutions as such can produce innovations and competitive products. Still it is typical for the innovations to be introduced in the operating enterprises both in the production and technology process and in the final output or service, which the entrepreneurs themselves do not identify as innovations and do not take relevant actions to protect these. The results of the study on the perspectives of cooperation between business and science also indicate that the entrepreneurs often have inadequate understanding of the research process, new products and technologies.

As the participants of idejuTalka and focus group admitted, the lack of information on scientific institutions and their operation and the lack of communication between the scientific institutions and the entrepreneurs both on cross-border and on regional level presents a substantial obstacle for employment and capitalization of the research results. Rēzekne Higher Education Institution, being a member of Rēzekne Association of Entrepreneurs, has established a successful cooperation platform

on local level, which introduces the entrepreneurs with the research capacity of the higher education institution through the activities undertaken by the association.

Establishment of efficient cooperation platforms between the business and the research and educational sectors is the precondition for regional growth and is one of the European cooperation trends while creating clusters and innovation systems. The Europe 2020 strategy emphasizes the necessity for the universities and local enterprises to cooperate in the field of research and development and to create clusters for common use of resources. Getting the most important border region actors involved enables to create an innovative and open environment for the development of the individual actors, the relevant sectors (for example, metal working, plastic industry, environment technologies) and the region, to promote and facilitate research activities for business needs, to implement measures for stimulating the market, to ensure adoption and introduction of the best innovation and technology practice in the region.

The public sector also plays a role in the promotion of innovations and research. As the experience of other countries proves, the public sector may promote innovations and research by its own example both in the industrial and service sector.

6.2.4. Quality and awareness of science and research

The science and research in Latvia is characterized by a relatively limited number of scientific publications, therefore globally competitive scientific and research activities are carried out only in certain fields.

In Latgale and Utena region the scientific and research institutions are mainly concentrated around the higher education institutions of Daugavpils and Rēzekne in Latvia and around Utena College in Lithuania. Daugavpils and Rēzekne in particular, being the regional education centres, have the potential of becoming research centres of the region. The participants of idejuTalka also acknowledged that scientific institutions that are capable of competing on international scale act as an important step towards creation of new products. The Europe 2020 strategy states the necessity of regional research infrastructure as one of the regional development aspects.

The scientific institutions of Latgale region are participating in the international research projects in some fields. A competitive material base has been created in several fields (innovative microscope centre, possibilities for prototyping of plastic products), which are competitive according to the representatives of the scientific institutions both on national and international level. The higher education institutions are recruiting foreign lecturers and researchers as well. Still ensuring of international operation and conduct of qualitative fundamental studies requires additional investments not only in equipment, but in facilities as well, thus providing qualitative working conditions.

Essential aspect for the development of science, research and technologies is emerging of new talents and researchers in the sector. The most talented students rarely choose research as their professional activity after graduation and often even leave the region to continue their activities

elsewhere in the country or the world. It is important to supplement the measures for improving of the infrastructure, competence and prestige of the scientific and research institutions with activities that would encourage the young talents to get involved in research activities specifically in the border region.

Not only do the international cooperation measures serve as the basis for improving the qualification of scientists and researchers but also provide the possibilities for transferring knowledge and technologies. The capacity of the research institutions can be improved and the best practice of knowledge capitalization mechanisms can be adopted through cooperation.

7. Research and technology development strategy

7.1. Objectives of the strategy

The general objective of the strategy is to increase the number of innovative, technologically oriented and export capable enterprises in Latgale region and Lithuania border region.

The objectives of the strategy are:

1. To improve the business activity of border region, creating business friendly conditions.
2. To encourage operational efficiency of the scientific and research institutions, promoting the commercialization of research results.
3. To stimulate the ability of the cross-border enterprises to create technologically innovative products by using the resources available in the region.
4. To develop internationally competitive research institutions that are oriented towards excellence in research, technologies and innovations.

7.2. Priorities and support areas of the strategy

1st Priority: Creation of external environment favourable for innovation development

Support areas:

- 1.1. Encouraging of general creativity;
- 1.2. Environment favourable for business start-up and development;
- 1.3. Adequate public infrastructure;
- 1.4. Creation of the region's image;

2nd Priority: Use of the existing scientific potential and research results

Support areas:

- 2.1. Development and improvement of the capacity of technology transfer centres and offices;
- 2.2. Development of business skills among the students, scientists and researchers of different fields;
- 2.3. Promoting of research and development institutions of the region in the local and foreign markets;

3rd Priority: Client commissioned research

Support areas:

- 3.1. Acknowledgement and use of the internal innovation potential of the enterprises;
- 3.2. Availability of information on the existing research resources and research results and improving understanding of the research processes among the entrepreneurs;
- 3.3. Creation of clusters of cooperation platform to promote research for business needs;

3.4. Involvement of the public sector in research facilitation;

4th Priority: Integration within the global research area

Support areas:

- 4.1. Development of the infrastructure of scientific and research institutions;
- 4.2. Improvement of the capacity of scientific and research institutions;
- 4.3. Recruiting new talents to research;
- 4.4. Access to international research and innovation resources, cooperation networks, encouraging of cooperation;

7.3. Activity plan of the strategy

1st Priority: Creation of external environment favourable for innovation development

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|---|--|--|--------|
| 1.1.Support area: Encouraging of general creativity | | | | |
| 1.1.1. Integration of subjects encouraging creative and innovative thinking in the academic programs of all education levels; | Issue to be solved on national scale by involving ministries, institutions responsible for the content of academic programs, educational institutions of all levels and other stakeholders. Measures to be performed by the educational institutions of Latgale planning region and Lithuania border region: ❖ Supplementing academic programs with subjects that encourage innovative thinking within the framework of their competence; ❖ Representation of interests. | State financing | medium -term | LV, LT |
| 1.1.2. Innovation friendly environment – aspect to be considered while developing the municipal infrastructure; | Municipalities | n/a | medium-term | LV, LT |
| 1.1.3. Creativity seminars for different population groups (municipal personnel, entrepreneurs, academic | Organization of seminars can be provided by different stakeholders (NGOs, educational institutions, municipalities, | Financing of the organizers, municipal financing, EU co- | short-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|--|---|--|--------|
| personnel, students, pupils); | Latgale planning region, etc.); | financing. | | |
| 1.1.4. Creative solution competitions for the purpose of solving the problems of the municipalities of the border regions and to encourage development; | Municipalities, Latgale planning region | Municipal financing by using the existing platforms, for example, , manabalss.lv, municipal and Latgale planning region's information networks, etc., EU co-financing | short-term | LV, LT |
| 1.1.5. Informing the population about the essence and practical application of creativity – best examples from different fields: “from “crazy” idea to the result”: ❖ in mass media; ❖ meetings with implementers of creative ideas; ❖ short films made by students and young people (DU has Multimedia centre); | Educational institutions (Daugavpils University, Rēzekne Higher Education Institution, Utena College, branches of higher education institutions in Latgale), business NGOs, business support structures (business incubators, business information centres). | Financing of the organizers, municipal financing, EU co-financing. | short-term | LV, LT |
| 1.1.6. Students' Bachelor and Master thesis on creativity, creative practical works in professional education; | Higher education institutions, professional education institutions | n/a | short-term | LV, LT |
| 1.1.7. Untraditional solutions / installations / objects in daily environment, during different events (for example, during the city festivities). | Municipalities, enterprises, NGOs, educational institutions | Municipal financing, enterprise financing, NGO financing, EU co-financing. | short-term | LV, LT |

| Support area, activities | | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|--|---|--|---|--|--------|
| Activities encouraging innovations and creativity within the framework of city festivities and other events; | | | | | |
| 1.1.8. | Development of Daugavpils Science Festival; | Daugavpils University and scientific institutions | Financing of the organizers, financing of Daugavpils municipality, involvement of Daugavpils municipality and surrounding educational institutions in promotion of the event. | short-term | LV |
| 1.1.9. | Participation of higher education institutions and scientific institutions in the event "Scientists night" and public promotion of the event; | Higher education institutions, scientific institutions | Financing of the organizers, involvement of municipalities and educational institutions in promotion of the event. | short-term | LV |
| 1.2. | Support area: Environment favourable for business start-up and development | | | | |
| 1.2.1. | Ensuring and developing operation of business incubators and technological parks: ❖ Creative Service Centre of Eastern | Business support structures | Financing of business support structures, EU co-financing, state, municipal | medium-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|--|---|-------------------------------|--|--------|
| <ul style="list-style-type: none"> ❖ Latvia's municipalities; ❖ Business incubator of Balvi; ❖ Business incubator of Ignalina Nuclear Power Station region; ❖ Latgale Machinery and Technology centre; ❖ Līvāni Engineering and Innovation centre; ❖ Business incubator of Preiļi; ❖ Innovation centre of Rēzekne Higher Education Institution. | | financing. | | |
| 1.2.2. Adjustment of academic programs to the national economic needs at all education levels, which would ensure supply of labour force compliant with the business needs; | <p>Issue to be solved on national scale by involving ministries, institutions responsible for the content of academic programs, educational institutions of all levels and other stakeholders.</p> <p>Measures to be performed by the educational institutions of Latgale planning region and Lithuania border region:</p> <ul style="list-style-type: none"> ❖ Coordination of academic programs with the regional entrepreneurs and adjustment to the needs of the entrepreneurs within the framework of their competence; <p>Measures to be performed by the enterprises:</p> <ul style="list-style-type: none"> ❖ active involvement in planning of | State financing. | medium-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|--|---|---|--|--------|
| | academic programs; ❖ providing practice places for pupils and students. | | | |
| 1.2.3. Provision of structured and unified information on all business support structures available in the vicinity (business incubators, technological parks): ❖ Website of Latgale planning region ❖ Websites of municipalities of Latgale and Lithuania regions | Latgale planning region and municipalities of Lithuania border region | Latgale planning region - financing for preparation and updating of information, municipalities – financing for publishing. | short-term | LV, LT |
| 1.2.4. Ensuring operation of Rēzekne Special Economic Zone. Audit of similar events, municipal tax allowance implementation possibilities in the biggest municipalities of border territory; | Rēzekne District Council, municipalities of cross-border region | Municipal financing | short-term | LV, LT |
| 1.2.5. Ensuring EU co-financing for start-up and development of business in Latgale region and Lithuania border region in the planning period from 2014-2020; | Issue to be solved on national scale. Tasks of the stakeholders of Latgale region and Lithuania border region (Latgale planning region, municipalities, educational institutions, business NGOs, etc.): ❖ to represent the interests of the regions in the process of planning EU financing, on national and EU level; ❖ to provide proposals for support tools and supportable activities. | n/a | short-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|--|--------------------------------|--|--|--------|
| 1.2.6. Improving and adjusting the municipal service system to the needs of the entrepreneurs by introducing one-stop principle and developing e-services; | Municipalities | Municipal financing, EU co-financing | short-term | LV, LT |
| 1.2.7. The analysis of potential use of the existing industrial territories for business and research needs; | Municipalities | Municipal financing, EU co-financing | short-term | LV |
| 1.3.Support area: Adequate public infrastructure | | | | |
| 1.3.1. Improvement of motor road quality in Latvia both for the main highways and for the communication within the border region; | State, municipalities | State, municipal financing, EU co-financing | medium-term | LV |
| 1.3.2. Improvement and adjustment of power supply system for the industrial needs in Latgale; | State, municipalities | Financing of the power supply company, municipal co-financing, EU co-financing | medium-term | LV |
| 1.3.3. Improvement of internet and communication network; | State, municipalities | Financing of the service provider, EU co-financing | medium-term | LV,LT |
| 1.3.4. Implementation of Daugavpils airport project ; | State, Daugavpils municipality | Financing of the project implementer, state, municipal co-financing, EU co-financing | medium-term | LV |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|---|--|--|-------|
| 1.4.Support area: Creation of the region's image | | | | |
| 1.4.1. Promoting the border region as a favourable site for business and research on national and international scale, emphasizing the advantages and available resources of the region (at public events with involvement of the region and the municipalities, representing the interests of the region in planning processes); | Latgale planning region, municipalities | n/a | short | LV,LT |
| 1.4.2. Participation in international exhibitions and events; | Latgale planning region, municipalities | State and municipal financing, EU co-financing | short | LV,LT |
| 1.4.3. Participation in international cooperation projects in different fields; | Latgale planning region, municipalities, municipal institutions | State and municipal financing, EU co-financing | short | LV,LT |
| 1.4.4. Creation and maintenance of a regional level electronic enterprise directory (by using Lursoft platform); | Latgale planning region, municipalities | Municipal financing, EU co-financing | medium-term | LV,LT |

2nd Priority: Use of the existing scientific potential and research results

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|--|--|--|--|-------|
| 2.1. Support area: Development and improvement of the capacity of technology transfer centres and offices (technology transfer office of Daugavpils University, technology transfer office of Rēzekne Higher Education Institution) | | | | |
| 2.1.1. Educating the employees of technology transfer offices and scientific institutions on the subject of cooperation with entrepreneurs; | Daugavpils University, Rēzekne Higher Education Institution | Financing of the higher education institutions, EU co-financing | short-term | LV |
| 2.1.2. Recruiting of qualified consultants / specialists to develop the action plan and mechanisms, to identify the capitalization channels; | Daugavpils University, Rēzekne Higher Education Institution | Financing of the higher education institutions, EU co-financing | short-term | LV |
| 2.1.3. Experience exchange events on national, cross-border and international scale; | Daugavpils University, Rēzekne Higher Education Institution | Financing of the higher education institutions, EU co-financing | short-term | LV |
| 2.1.4. Extending the operation of technology transfer offices (in regard to sectors); | Daugavpils University, Rēzekne Higher Education Institution | Financing of the higher education institutions, EU co-financing | medium-term | LV |
| 2.1.5. Ensuring availability of information on the operation of technology transfer centres by using different communication | Daugavpils University, Rēzekne Higher Education Institution, Latgale planning region, municipalities of Lithuania border region, business support structures | Financing of the higher education institutions, financing of the municipalities of | short-term | LV,LT |

| Support area, activities | | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|---|---|---|--|--------|
| channels, and, for example, improving the website of Rēzekne Higher Education Institution VTTP; | | | Latgale planning region and border regions, and financing of the business support structures for information publishing | | |
| 2.1.6. | Participation in foreign scientific events, conferences of the relevant sectors, exhibitions, etc. | Daugavpils University, Rēzekne Higher Education Institution | Financing of the higher education institutions, EU co-financing | short-term | LV |
| 2.1.7. | Educating scientists on the subject of intellectual property law and the related regulations and provisions (organization of seminars, regular training) | Daugavpils University, Rēzekne Higher Education Institution | Financing of the higher education institutions, EU co-financing | short-term | LV |
| 2.1.8. | Establishing cooperation with legal patent enterprises to recruit patent principals and relevant specialists; | Daugavpils University, Rēzekne Higher Education Institution | n/a | short-term | LV |
| 2.2. Support area: Development of business skills among the students, scientists and researchers of different fields | | | | | |
| 2.2.1. | Integrating business subjects in all higher education programs in Daugavpils University, Rēzekne Higher Education Institution, branches of the higher education | Issue to be solved on national scale by involving ministries, institutions responsible for the content of academic programs, higher education institutions. Measures to be performed by the higher | State financing, financing of the higher education institution | medium-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|--|---|--|--------|
| institutions in Latgale and Utena College; | education institutions: ❖ Supplementing academic programs with business subjects within the framework of their competence; ❖ Representing interests. | | | |
| 2.2.2. Interdisciplinary educational enterprises on the basis of the scientific studies and their intellectual property, which involve students and which are consulted by the personnel of different higher education institutions and the scientific personnel; | Daugavpils University, Rēzekne Higher Education Institution, branches of the higher education institutions in Latgale and Utena College | State financing, financing of the higher education institution, EU co-financing | medium-term | LV, LT |
| 2.2.3. Opportunities of continued education in business field for scientists and researchers; | Daugavpils University, Rēzekne Higher Education Institution, branches of the higher education institutions in Latgale and Utena College | State financing, financing of the higher education institution, EU co-financing | medium-term | LV, LT |
| 2.2.4. Practice of scientists and researchers of different disciplines in enterprises at local and international level; | Daugavpils University, Rēzekne Higher Education Institution, branches of the higher education institutions in Latgale and Utena College | Financing of the higher education institution, financing of the enterprises | short-term | LV, LT |
| 2.2.5. Practice of students of different disciplines in enterprises | Daugavpils University, Rēzekne Higher Education Institution, branches of the higher education institutions in Latgale and Utena | Financing of the higher education institution, financing of the | short-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|---|--|--|--------|
| | College | enterprises | | |
| 2.2.6. More favourable conditions and advantages for the SMEs based on research and technology development to join business incubators and by using the services of other supporting structures; | Business incubator of Balvi, business incubator of Ignalina Nuclear Power Station region, Latgale Technological and Machinery centre, Līvāni Engineering and innovation centre, business incubator of Preiļi, Innovation centre of Rēzekne Higher Education Institution | n/a | short-term | LV, LT |
| 2.2.7. Business and scientific mentoring for the new technological enterprises; | Business support structures, scientific and educational institutions | Financing of the business support structures, financing of the educational institutions, EU co-financing | medium-term | LV,LT |
| 2.3. Support area:Promoting of research and development institutions of the region in the local and foreign markets | | | | |
| 2.3.1. Providing information to Latvian, Lithuanian and foreign enterprises on the research and development services, technologies and intellectual property available in the border region:: ❖ By using subsidiary companies in Latvia (scientific institutions, EU support); | Scientific institutions | Financing of the scientific institutions, EU co-financing | short-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|--|-------------------------|---|--|--------|
| ❖ By participating in international exhibitions of the sector; | | | | |
| 2.3.2. Publications / advertising in specialized publications of the sector, popular science publications; | Scientific institutions | Financing of the scientific institutions, EU co-financing | medium-term | LV, LT |

3rd Priority: Client commissioned research

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|---|---|--|--------|
| 3.1. Support area: Acknowledgement and use of the internal innovation potential of the enterprises | | | | |
| 3.1.1. Innovation audit in the enterprises, considering the specifics of the applied technology and production; | Entrepreneurs, business support structures | Financing of enterprises | short-term | LV, LT |
| 3.1.2. Patenting the innovative technological and product solutions implemented in the enterprises; | Entrepreneurs, business support structures | Financing of enterprises, EU co-financing | medium-term | LV, LT |
| 3.1.3. Recruitment of qualified specialists and scientific trainees to enterprises for the purpose of solving specific technological problems and developing new products; | Entrepreneurs, educational institutions, scientific and research institutions | Financing of enterprises, EU co-financing | short-term | LV, LT |
| 3.1.4. Practice of entrepreneurs in scientific institutions; | Entrepreneurs, scientific and research institutions | Financing of enterprises, EU co-financing | short-term | LV, LT |
| 3.1.5. Technology transfer from abroad; | Entrepreneurs | Financing of enterprises, EU co-financing | medium-term | LV, LT |
| 3.2. Support area: Availability of information on the existing research resources and research results and improving understanding of the research processes among the entrepreneurs | | | | |
| 3.2.1. User friendly websites of the scientific and research institutions; | Scientific and research institutions | Financing of the scientific and research | short-term | LV |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|--|--|--|--|--------|
| | | institutions, financing of the higher education institutions | | |
| 3.2.2. Ensuring availability of scientific and research institutions; (active communication with potential stakeholders, using different information channels); | Scientific and research institutions | Financing of the scientific and research institutions, financing of the higher education institutions | short-term | LV |
| 3.2.3. Creating a virtual science and research information site – science and technology directory of the border region which includes information on scientific institutions, their main research disciplines, infrastructure, patents, commercialization offers, technology transfer offices etc.; | Scientific institutions responsible for preparing of information, municipalities of Latgale planning region and border region responsible for gathering and maintenance of information in the websites | Financing of the scientific and research institutions, financing of Latgale planning region and municipalities for maintenance of information, EU co-financing | short-term | LV, LT |
| 3.2.4. Creating a business-science contact office in Latvia and Lithuania capable of analyzing and providing information on science and research and business resources of the region. The office can be established on the basis of technology transfer office, business incubator, business information centre, but it should provide regional coverage and cooperate with all stakeholders; | Scientific institutions, higher education institutions, business support structures, business NGOs, Latgale planning region | Financing of the scientific and research institutions, financing of the higher education institutions, municipal financing, EU co-financing | medium-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|--|---|---|--|--------|
| <p>3.2.5. Availability and provision of structured information on scientific institutions and their research activities from the business support and information structures:</p> <ul style="list-style-type: none"> ❖ Creative Service Centre of Eastern Latvia's Municipalities ❖ Business incubator of Balvi ❖ Business incubator of Ignalina Nuclear Power Station region, ❖ Latgale Technological and Machinery centre ❖ Līvāni Engineering and Innovation centre ❖ Business incubator of Preiļi ❖ Innovation centre of Rēzekne Higher Education Institution ❖ Business information centres or from the relevant municipal specialists; | Scientific institutions, business support structures, municipalities, Business-science contact office | Financing of the scientific institutions for preparation of information | short-term | LV, LT |
| 3.2.6. Publishing of the studies and their results in mass media available in the language understood by wide population range; | Scientific institutions, Business-science contact office | Financing of the scientific and research institutions, financing of the higher education institutions | short-term | LV |
| 3.2.7. Scientists' exhibition during the municipal and regional business days; | Scientific institutions, Business-science contact office | Financing of the scientific and research institutions, financing of the higher | short-term | LV |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|---|---|--|--------|
| | | education institutions | | |
| 3.2.8. Membership of higher education institutions and scientific institutions in business organizations | Scientific institutions, higher education institutions | Financing of the scientific and research institutions, financing of the higher education institutions | short-term | LV |
| 3.2.9. Excursions to scientific institutions (for entrepreneurs, business starters, students of different disciplines); | Scientific institutions, higher education institutions, Business-science contact office | Financing of the scientific and research institutions, financing of the higher education institutions | short-term | LV |
| 3.3. Support area: Creation of clusters of cooperation platform to promote research for business needs | | | | |
| 3.3.1. Explaining of business needs to researchers and scientists – common sector and interdisciplinary work groups and seminars; | Scientific institutions, higher education institutions, business NGOs, enterprises, Business-science contact office | Financing of the scientific and research institutions, financing of the higher education institutions, financing of enterprises | short-term | LV |
| 3.3.2. Creating clusters through cooperation between the traditional and the new sector enterprises of the region (metal working, metal industry, plastic industry, sectors related to environment technologies and renewable energy resources, | Scientific institutions, higher education institutions, business NGOs, enterprises, Business-science contact office | Financing of the scientific and research institutions, financing of the higher education | medium-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-5 years) | LV/LT |
|---|--|---|--|--------|
| production of different equipment and electronic tools, etc.) and the scientific institutions and new innovative enterprises from collateral sectors; | | institutions, financing of enterprises, EU co-financing | | |
| 3.3.3. Acknowledgement, promoting and implementing in the enterprises of the best practice in innovation and technology field; | Entrepreneurs, scientific institutions | Financing of enterprises, EU co-financing | medium-term | LV, LT |
| 3.3.4. Implementation of joint research projects, market oriented studies for business needs; | Entrepreneurs, scientific institutions | Financing of enterprises, EU co-financing | medium-term | LV, LT |
| 3.3.5. Involvement of the enterprises in planning state commissioned research activities; | Institutions responsible for state commissioned research | n/a | short-term | LV, LT |
| 3.4. Support area: Involvement of the public sector in research facilitation | | | | |
| 3.4.1. Integration of research and innovation component in state and municipal procurement; | Municipalities, state institutions, planning region | n/a | short-term | LV, LT |

4th Priority: Integration within the global research area

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-10 years) | LV/LT |
|---|---|--|---|--------|
| 4.1. Support area: Development of the infrastructure of scientific and research institutions | | | | |
| 4.1.1. Creation and development of the scientific and research infrastructure (premises, equipment, facilities) for the purpose of ensuring scientific and research activities: <ul style="list-style-type: none"> ❖ Infrastructure of scientific institutes; ❖ Scientific and research infrastructure of the higher education institutions; ❖ Basic municipal infrastructure for development of scientific and technological parks in Rēzekne and Daugavpils. | Higher education institutions, scientific and research institutions, municipalities | Municipalities by allocating land, special economic zone advantages, other allowances, state and EU co-financing, co-financing of the enterprises, co-financing of the higher education institutions | medium-term | LV |
| 4.2. Support area: Improvement of the capacity of scientific and research institutions | | | | |
| 4.2.1. Ensuring the international mobility of the scientific personnel to foreign research institutions and enterprises; | Scientific institutions | Financing of the scientific institutions, EU co-financing | short-term | LV |
| 4.2.2. Interdisciplinary experience exchange events and seminars for the scientists | Scientific institutions | Financing of the scientific institutions, EU co-financing | short-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-10 years) | LV/LT |
|--|---|--|---|--------|
| and researchers of local and regional scale; | | | | |
| 4.2.3. Recruiting qualified foreign researchers to scientific institutions of Latvia; | Scientific institutions | Financing of the scientific institutions, EU co-financing | short-term | LV |
| 4.2.4. Creation of a motivating, performance based remuneration system for the scientific personnel of the public sector; | Issue to be solved on national scale. Measures to be performed by the higher education institutions and scientific institutions of Latgale planning region: ❖ Representation of interests; ❖ Proactive preparation of proposals. | State financing, financing of the scientific institutions | medium-term | LV |
| 4.3. Support area: Recruiting new talents to research | | | | |
| 4.3.1. Availability of information for the prospective and current students concerning the scientific career opportunities and perspectives: ❖ career consultants in the schools; ❖ presentation of the scientific institutions and researchers for the students of higher education institutions; ❖ user friendly websites of the scientific | Education institutions of all levels, scientific institutions, Business – science contact office | Financing of the education institutions, municipal financing, financing of the scientific institutions | short-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-10 years) | LV/LT |
|---|--|--|---|--------|
| and research institutes; | | | | |
| 4.3.2. Proactive cooperation between the scientific institutions and the students of the higher education institutions in writing of Bachelor and Master thesis: ❖ possibility to use the infrastructure of scientific and research institutions; ❖ scientific mentoring. | Higher education institutions, scientific institutions | n/a | short-term | LV, LT |
| 4.3.3. Regional scholarships, aid for acquisition or rent of dwelling place and other support measures for Ph.D. students and doctors for the purpose of research conduct; | Municipalities | Municipal financing, financing of the higher education institutions | medium-term | LV |
| 4.4. Support area: Access to international research and innovation resources, cooperation networks, encouraging of cooperation | | | | |
| 4.4.1. Participation in international scientific conferences; | Higher education institutions, scientific institutions, clusters | Financing of the higher education institutions, financing of the scientific institutions, financing of the enterprises | medium-term | LV |
| 4.4.2. Publications in recognized scientific journals | Higher education institutions, scientific institutions | Financing of the higher education institutions, financing of the scientific institutions | medium-term | LV |
| 4.4.3. Participation of scientific institutions | Higher education institutions, | Financing of the higher | short-term | LV, LT |

| Support area, activities | Responsible institution | Potential source of financing | Short-term (1-3 years) / medium-term (3-10 years) | LV/LT |
|--|---|---|---|--------|
| and enterprises in international cooperation projects | scientific institutions, enterprises | education institutions, financing of the scientific institutions, financing of the enterprises, EU co-financing | | |
| 4.4.4. Research in the EU priority fields (environment technologies, nanotechnologies, etc.) | Higher education institutions, scientific institutions | Financing of the higher education institutions, financing of the scientific institutions, EU co-financing | medium-term | LV, LT |
| 4.4.5. Involvement in the creation of open innovations both with the enterprises and the research organizations on global scale; | Higher education institutions, scientific institutions | Financing of the higher education institutions, financing of the scientific institutions, EU co-financing | medium-term | LV, LT |
| 4.4.6. Participation in international cluster programs and contact networks in the traditional sectors of the cross-border region; | Higher education institutions, scientific institutions, enterprises | Financing of the higher education institutions, financing of the scientific institutions, financing of the enterprises, EU co-financing | medium-term | LV, LT |

8. Recommendations

1. To encourage implementation of measures in the cross-border region which stimulate the general business activity both among the local population and by making the region more attractive for external investors.
2. To create the innovation system of the cross-border region by concentrating resources in Daugavpils and Rēzekne and by involving regional education institutions, scientific and research institutions, business support structures and municipalities. Establish business – science contact offices in Latgale region and Utena region for the purposes of coordinating the innovation system;
3. To provide structured information on the scientific and research institutions of the cross-border region, their field of activities, research results, the innovative enterprises of the region, business support structures. To ensure maximum availability of the information for the public (websites of the stakeholders, social networks);
4. To ensure information exchange within the innovation system in sectoral and intersectoral section by organizing regular meetings and events between the scientific institutions, education institutions and enterprises;
5. To stimulate formation of clusters and development of research in the sectors where the regional enterprises are operating, and in the related collateral sectors, and where the scientific and research capacity is available:
 - ❖ metal working;
 - ❖ mechanical engineering, production of equipment;
 - ❖ plastic industry;
 - ❖ environment technologies and renewable energy resources;
6. To ensure connection of the measures for support of the scientific and research infrastructure with the existing infrastructure, mechanisms of the technology transfer and research result capitalization, research publications, business development infrastructure, the location of the enterprises and the existing scientific and education institutions in the cross-border region, which are mainly concentrated in Daugavpils and Rēzekne, thus establishing two science, research and business development platforms.
7. To stimulate the increase of the capacity of scientific and research institutions, ensuring support for the development of the infrastructure and recruiting new human resources to the science and research. To encourage international competitiveness of the scientific institutions in the long-term.
8. To concentrate the science and research infrastructure at the regional level priority on the research needs of the region (current business sectors) and the potential demand of the

foreign countries in the field of applied and industrial studies, simultaneously providing for the possibility to perform fundamental studies in long-term as well.

9. To ensure the awareness and availability of the research results and the services provided by the scientific institutions primarily for the entrepreneurs and business starters of the cross-border region, as well as on the national and international scale in long-term.
10. To provide the possibilities to capitalize the research results and to improve the understanding of the business of the scientific personnel and students from the different disciplines.
11. To ensure support for the enterprises for the development and implementation of innovations, as well cooperation with scientific institutions for the purpose of both research conduct and mobility of the human resources.
12. To encourage involvement of scientific institutions and enterprises in the international research projects and innovation networks.
13. To encourage involvement of the public sector in the use of innovative products and services.

9. Verification and evaluation plan of the strategy implementation

| Purpose of the strategy | Information source |
|---|---|
| <i>To increase the number of innovative, technologically oriented and export capable enterprises in Latgale region and Lithuania border region</i> | |
| 1. Number of enterprises in business incubators | Business incubators |
| 2. Number of innovative and technological enterprises in business incubators | Business incubators |
| 2. Number of newly established enterprises and operational sectors in the cross-border region | Institutions responsible for enterprise register, Central Statistical Bureau of the Republic of Latvia, Statistical Department of Lithuania |
| 3. Number of enterprises and operational sectors in the cross-border region | Central Statistical Bureau of the Republic of Latvia, Statistical Department of Lithuania |
| 4. Export volumes of the enterprises of cross-border region | Central Statistical Bureau of the Republic of Latvia, Statistical Department of Lithuania |

| Objective, priority, support area, indicators | Information source | Performance assessment and inspections |
|---|--|---|
| <i>To improve the business activity of border region, creating business friendly conditions.</i> | | |
| <i>1st Priority: Creation of external environment favourable for innovation development</i> | | |
| 1.1. Encouraging of general creativity | | |
| 1.1.1. Number of improved academic programs in the cross-border region by introducing creative thinking | Educational institutions, responsible state institutions | After implementation of the measures |
| 1.1.2. Number of pupils and students mastering the new creative thinking programs | Educational institutions, responsible state institutions | Annually after implementation of the measures |
| 1.1.3. Number of public events encouraging creativity | Municipalities, educational institutions | Annually |
| 1.1.4. Size of the target group addressed in public events and informative events | Municipalities, educational institutions | Annually |
| 1.1.5. Number of Bachelor and Master thesis on the topic of encouraging | Higher education institutions | Annually |

| Objective, priority, support area, indicators | Information source | Performance assessment inspections | of and |
|---|---|--------------------------------------|--------|
| creativity | | | |
| 1.1.6. Number of scientific institutions participating in public events | Municipalities, educational institutions | Annually | |
| 1.2.Environment favourable for business start-up and development | | | |
| 1.2.1. Number of enterprises in business incubators | Business incubators | Annually | |
| 1.2.2. Number of innovative and technological enterprises in business incubators | Business incubators | Annually | |
| 1.2.3. Number of newly established enterprises and operational sectors in the cross-border region | Institutions responsible for enterprise register, Central Statistical Bureau of the Republic of Latvia, Statistical Department of Lithuania | Annually | |
| 1.2.4. Number of enterprises and operational sectors in the cross-border region | Central Statistical Bureau of the Republic of Latvia, Statistical Department of Lithuania | Annually | |
| 1.2.5. Number of enterprises in technological parks | Technological parks | Annually | |
| 1.2.6. Number of enterprises using the advantages of special economic zone | Rēzekne municipality | Annually | |
| 1.2.7. Number of innovative and technological enterprises using the advantages of special economic zone | Rēzekne municipality | Annually | |
| 1.2.8. The EU co-financing used for business start-up and development in the cross-border region | Institutions administering EU funds | Annually | |
| 1.2.9. Number of entities receiving the aid for business start-up and development of EU co-financing in the cross-border region | Institutions administering EU funds | Annually | |
| 1.2.10. Number of educational programs improved by adjusting to the needs of the labour market in the cross- | Educational institutions, responsible state institutions | After implementation of the measures | |

| Objective, priority, support area, indicators | Information source | Performance assessment and inspections |
|--|--|---|
| border region | | |
| 1.2.11. Number of pupils and students mastering the new, adjusted educational programs | Educational institutions, responsible state institutions | Annually after implementation of the measures |
| 1.2.12. Indices of pupil and student employment after mastering of the educational programs | Educational institutions, responsible state institutions | Annually after implementation of the measures |
| 1.2.13. Number of the regional enterprises actively involved in planning of the education process | Educational institutions, responsible state institutions | Annually after implementation of the measures |
| 1.2.14. Opinion of the entrepreneurs on the compliance of labour force | Surveys | Biennially |
| 1.3. Adequate public infrastructure | | |
| 1.3.1. Number of improved infrastructure objects, investment scope | Municipalities | Annually |
| 1.3.2. Opinion of the population and entrepreneurs on the compliance of infrastructure | Surveys | Biennially |
| 1.4. Creation of the region's image | | |
| 1.4.1. Opinion of the entrepreneurs on the business environment in the region and the region's image | Enterprise surveys | Biennially |
| 1.4.2. Publications in mass media on the territories of the cross-border region | Results of the media monitoring | Annually |
| <i>To encourage operational efficiency of the scientific and research institutions, promoting the commercialization of research results</i> | | |
| <i>2nd Priority: Use of the existing scientific potential and research results</i> | | |
| 2.1. Development and improvement of the capacity of technology transfer centres and offices | | |
| 2.1.1. Number of professional events involving representatives of technology transfer offices | Technology transfer offices | Annually |
| 2.1.2. Number of patents and commercialization offers in technology transfer offices | Technology transfer offices | Annually |

| Objective, priority, support area, indicators | | Information source | Performance assessment and inspections |
|---|---|--|---|
| 2.1.3. | Number of successful commercialization projects | Technology transfer offices | Annually |
| 2.1.4. | Number of scientists who have participated in the informative events implemented by the technology transfer centres and who have been provided consulting | Technology transfer offices | Annually |
| 2.1.5. | Number of entrepreneurs and potential investors, who have addressed the technology transfer centres | Technology transfer offices | Annually |
| 2.2. Development of business skills among the students, scientists and researchers of different disciplines | | | |
| 2.2.1. | Number of the improved educational programs for business studies in the cross-border region | Educational institutions, responsible state institutions | After implementation of the measures |
| 2.2.2. | Number of pupils and students of different disciplines mastering the new business subjects | Educational institutions, responsible state institutions | Annually after implementation of the measures |
| 2.2.3. | Number of educational enterprises | Higher education institutions | Annually after implementation of the measures |
| 2.2.4. | Number of students involved in the operation of the educational enterprises | Higher education institutions | Annually after implementation of the measures |
| 2.2.5. | Number of enterprises that have been established on the basis of the educational enterprises | Higher education institutions | Annually after implementation of the measures |
| 2.2.6. | Number of scientists and students who have undergone practice in enterprises, training and other business stimulating measures | Higher education institutions | Annually after implementation of the measures |
| 2.2.7. | Number of innovative and technological enterprises in the business incubators | Business incubators | Annually |
| 2.2.8. | Number of the enterprises established on the basis of | Higher education institutions | Annually after implementation of |

| Objective, priority, support area, indicators | Information source | Performance assessment and inspections | of and |
|--|---|--|--------|
| research result | | measures | |
| 2.3. Promoting of research and development institutions of the region in the local and foreign markets | | | |
| 2.3.1. Number of publications in sectoral journals, popular science publications | Scientific institutions | Annually | |
| 2.3.2. Number of most popular sectoral and business events for information dissemination | Scientific institutions | Annually | |
| 2.3.3. Number and scope of research service orders | Scientific institutions | Annually | |
| <i>To stimulate the ability of the cross-border enterprises to create technologically innovative products by using the resources available in the region.</i> | | | |
| <i>3rd Priority: Client commissioned research</i> | | | |
| 3.1. Acknowledgement and use of the internal innovation potential of the enterprises | | | |
| 3.1.1. Number of patents in the regional enterprises | Institutions responsible for patent issuing | Triennially | |
| 3.1.2. Number of scientists and researchers working in the enterprises, for their needs | Scientific institutions | Annually | |
| 3.1.3. Number of products and technologies developed in the enterprises | Enterprise surveys | Triennially | |
| 3.2. Availability of information on the existing research resources and research results and improving understanding of the research processes among the entrepreneurs | | | |
| 3.2.1. Virtual science and research information site of the cross-border region | Website | After implementation of the measure | |
| 3.2.2. Business – science contact office | Business – science contact office | After implementation of the measures | |
| 3.2.3. Number of publications in media on the operation of the regional scientific institutions | Results of the media monitoring | Annually | |
| 3.2.4. Awareness of the population and entrepreneurs on the | Survey | Biennially | |

| Objective, priority, support area, indicators | Information source | Performance assessment inspections | of and |
|---|---|--------------------------------------|--------|
| operation of the scientific institutions | | | |
| 3.2.5. Number of scientific institutions participating in the events of the municipalities and the enterprises | Scientific institutions | Annually | |
| 3.2.6. Number of visitors of the scientific institutions | Scientific institutions | Annually | |
| 3.3. Creation of clusters of cooperation platform to promote research for business needs | | | |
| 3.3.1. Number of measures for cooperation of entrepreneurs and scientists | Scientific institutions | Annually | |
| 3.3.2. Number of participants of the measures or cooperation of entrepreneurs and scientists | Scientific institutions | Annually | |
| 3.3.3. Number of active clusters and cooperation platforms | Business information centres | Annually | |
| 3.3.4. Number of participants and turnover of the clusters | Cluster administrators | Annually | |
| 3.3.5. Number of research projects conducted within the clusters and on the basis of cooperation platforms | Cluster administrators | Annually | |
| 3.4. Involvement of the public sector in research facilitation | | | |
| 3.4.1. State and municipal procurement in the cross-region, which include the research and innovation component | Institutions publishing the procurement, municipalities | Annually | |
| <i>To develop internationally competitive research institutions that are oriented towards excellence in research, technologies and innovations</i> | | | |
| <i>4th Priority: Integration within the global research area</i> | | | |
| 4.1. Development of the infrastructure of scientific and research institutions | | | |
| 4.1.1. Scope of investments in the improvement of science and research infrastructure | Scientific institutions | After implementation of the measures | |

| Objective, priority, support area, indicators | Information source | Performance assessment and inspections | of and |
|---|-------------------------------|--|--------|
| 4.1.2. Load of the science and research infrastructure | Scientific institutions | Annually | |
| 4.1.3. Scope of public investments in the creation of technological parks | Municipalities | After implementation of the measures | |
| 4.1.4. Number of enterprises in the technological parks | Municipalities | Annually | |
| 4.2.Improvement of the capacity of scientific and research institutions | | | |
| 4.2.1. Number of scientific personnel who have participated in the mobility and qualification improvement measures | Scientific institutions | Annually | |
| 4.2.2. Number of foreign researchers in the scientific institutions of the cross-border region | Scientific institutions | Annually | |
| 4.2.3. Remuneration level of the personnel of public regional scientific institutions | Scientific institutions | Annually | |
| 4.3.Recruiting new talents to research | | | |
| 4.3.1. Number of Bachelor and Master thesis which involved cooperation with scientific institutions | Higher education institutions | Annually | |
| 4.3.2. Number of new scientists and researchers in the regional scientific institutions and higher education institutions | Scientific institutions | Annually | |
| 4.4.Access to international research and innovation resources, cooperation networks, encouraging of cooperation | | | |
| 4.4.1. Number of scientific publications | Scientific institutions | Annually | |
| 4.4.2. Number of presentations in the international domain | Scientific institutions | Annually | |
| 4.4.3. Number of international research projects | Scientific institutions | Annually | |
| 4.4.4. Number of international networks involving regional | Scientific institutions | Annually | |

| Objective, priority, support area, indicators | | Information source | Performance assessment and inspections |
|---|--|-------------------------|--|
| scientific institutions | | | |
| 4.4.5. | Scope of EU financing used for the research projects | Scientific institutions | Annually |

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38. „Innovation Union” home page: http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=key
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11. Appendices

Potentially innovative enterprises in Latgale.

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶¹ |
|------------------------------|--------------------|---|-------------|--|--|
| Daugavpils | | | | | |
| Interviewed companies | | | | | |
| 1. | SIA Nexis fibers | Production of synthetic fibres | 20.6 | Višķu 21, Daugavpils, LV-5410 Phone +371 65402124 Fax +371 65423349 | |
| 2. | Malung industries | Production of other plastic products | 22.29 | Tautas 102, Daugavpils, LV-5417 Phone +371 65440849 Fax +371 65407684 info@latplastic.com | |
| 3. | SIA Dinaburga teks | Production of other knitwear products | 14.39 | Višķu 17b, Daugavpils, LV-5410 Phone +371 65407230 | |
| 4. | SIA Axon Cable | Production of other electronic and electrical wires and cables | 27.32 | Višķu street 21c, LV-5410 Phone +371 65407891 Fax +371 65407893 axon@axoncable.lv | |
| 5. | SIA Latinsoft | Production of computers and other information processing devices | 30.02 | Mihoelsa street 56, Daugavpils, LV-5403 Phone +371 65423288 Fax +371 65423288 | |
| 6. | SIA Belmast | Production of metal structures and components | 25.11 | Višķu street 21z, LV-5410 Phone +371 65407017belmast@belmast.lv | |
| 7. | SIA LIA D | Wholesale of metal product pipes, heating equipment and accessories | 46.74 | Stiklu 16, Daugavpils, LV-5420 info@liad.lv Phone +371 65451182 | Introduction of new technology for metal production by using metal cutting with plasma jet and painting of products in painting camera 2.1.2.2.2.Design of new products and technologies – support for introduction of new products and technologies in production process. 2011. |

⁶¹ Information available on www.esfondi.lv, 2007 – 2013 planning period

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶¹ |
|-----------------------------------|--|---|-------------|---|--|
| Other companies identified | | | | | |
| 8. | SIA Latgales mācību centrs | Secondary technical and professional education | 85.32 | Saules 38-3.st., Daugavpils, LV-5401 Phone +371 65424655 Fax +371 65424655 lmc@lmc.lv | |
| 9. | SIA Būvlukss | Production of other non-metallic mineral products | 26.1 | Stiklu street 10, Daugavpils, LV-5404 Phone +371 65431481 | |
| 10. | SIA Šafrans | Construction of residential and non-residential buildings | 41.2 | Rīgas 40-1, Daugavpils, LV-5401 Phone +371 65425699 Fax +371 65425699 info@safrans-buve.lv | |
| 11. | Antares Latgale | Wholesale of other products, including fish, shellfish and molluscs | 46.38 | Malu street 2a, Daugavpils, LV-5401 Phone +371 65411244 Fax +371 65422680 info@antareslatgale.lv | |
| 12. | SIA Daugavpils Dzelzbetons | Production of concrete products for construction | 23.61 | Rūpniecības 1A, Daugavpils, LV-5404 Phone +371 65430392 Fax +371 65430392 | |
| 13. | SIA Zieglers mašīnbūve | Production of agricultural and forestry machinery | 28.3 | Spaļu 3, Daugavpils, LV-5404 Phone +371 65407333 | New product introduction – canola divider. 2.1.2.2.2. Design of new products and technologies – support for introduction of new products and technologies in production process 2011 |
| 14. | SIA Mamas D | Production of non-classified chemicals | 20.59 | Dzirnavu 22, Daugavpils, LV-5401 Phone +371 65420134, mamasd@apollo.lv | |
| 15. | AS Daugavpils Lokomotīvu Remonta Rūpnīca | Production of railway locomotives and rolling stock | 30.2 | Marijas 1, Daugavpils, LV-5404 Phone +371 65404420 Fax +371 65404420 info@dlrr.lv | New product introduction of AS "Daugavpils Lokomotīvu Remonta Rūpnīca" 2.1.2.2.2. Design of new products and technologies – support for introduction of new products and technologies in production process |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶¹ |
|-----|------------------------------|---|-------------|---|---|
| | | | | | 2011 |
| 16. | AS Latvijas maiznieks | Baking industry; production of fresh pastries and cakes | 10.71 | Mazā Viļņas street 9, Daugavpils, LV-5404 Phone +371 65476281 Fax +371 65476281 ofiss@dinella.lv | |
| 17. | AS Ditton pievadķēžu rūpnīca | Production of bearings, gearwheels, gear and drive elements | 28.15 | Višķu 17, Daugavpils, LV-5410 Phone +371 65402333 Fax +371 65445101 dpr@dpr.lv | Establishment of the enterprise "Ditton Chain" on the basis of "Ditton pievadķēžu rūpnīcas" (Ditton Driving Chain Factory) for production of new and qualitative products for export in metal working and engineering fields 2.1.2.4. High added value investments, 2010 |
| 18. | SIA Glaskek Latgale | Production of plastic construction elements | 22.23 | Imantas 23, Daugavpils, LV-5401 Phone +371 65407306 Fax +371 65424710 info@glскеk.lv | |
| 19. | AS MBD | Production of precast concrete mixes | 23.63 | Rūpniecības street 1m, Daugavpils, LV-5420 Phone +371 65438010 daugavpilsmb@mbbetons.lv | |
| 20. | SIA SM | Production of metal structures and components | 25.11 | A.Pumpura 3, Daugavpils, LV-5404 Phone +371 65407866 | New product introduction in SIA "SM" 2.1.2.2.2. Design of new products and technologies – support for introduction of new products and technologies in production process, 2011. |
| 21. | SIA East Metal | Production of metal structures and components | 25.11 | Stiklu 7g, Daugavpils, LV-5420 Phone +371 65456001 | Installation of metal working line to start production of wind generator components in the enterprise "East Metal" 2.1.2.2.2. Design of new products and technologies – support for introduction of new products and technologies in production process, 2011 |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶² |
|-----------------------------------|------------------------------|--|-------------|---|--|
| Rēzekne | | | | | |
| Interviewed companies | | | | | |
| 22. | RSEZ AS REBIR | Production of plastic products | 25.2 | Vīļakas 4, Rēzekne, LV-4600 Phone +371 64633405 ostmark@rebir.lv | |
| 23. | RSEZ SIA Larta1 | Production of agricultural and forestry machinery | 28.3 | Strādnieku šķērsstreet 5a/1, Rēzekne, LV-4604 Phone +371 64632081 larta@apollo.lv www.larta.lv | |
| 24. | SIA Latgalija | Construction of residential and non-residential buildings | 41.2 | Komunālā 2, Rēzekne, LV-4604 Phone +371 64634268 Fax +371 64633997 lena@latgalija.lv | Establishment of aluminium structures factory 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2010 |
| Other companies identified | | | | | |
| 25. | SIA Rēzeknes gaļas kombināts | Production of meat and poultry meat products | 10.13 | Rīgas street 22, Rēzekne, LV-4601 Phone +371 64607300 Fax +371 64628050 info@rgk.lv | |
| 26. | RSEZ SIA NewFuels | Production of other wood products; production of cork, straw and wicker products | 16.29 | Atbrīvošanas alley 169a, Rēzekne, LV 4604 Phone +371 64605785; Fax: +371 67602514 | Introduction of patented BioCO2al technology in industrial production process 2.1.2.2.2. Design of new products and technologies – support for introduction of new products and technologies in production process, 2011. |
| 27. | SIA Baltiks East | Production of tows, ropes and nets | 13.94 | Zilupes street 111, Rēzekne, LV-4601 Phone +371 64607287 Fax +371 64607288 baltiks@apollo.lv | |
| 28. | SIA Vecā maiznīca | Baking industry; production of fresh pastries and cakes | 10.71 | Brīvības 14k, Rēzekne, LV-4601 Phone +371 64625336 | |

⁶² Information available on www.esfondi.lv, 2007 – 2013 planning period

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶² |
|-----|--------------------------------|---|-------------|---|---|
| | | | | Fax +371 64621055 Veca.maiznica@apollo.lv | |
| 29. | RSEZ SIA Rēzeknes dzirnavnieks | Storage and warehouse management | 52.1 | Atbrīvošanas alley 167, Rēzekne, LV 4604 Phone +371 64634332 Fax +371 64634332 info@rezeknes-dzirnavnieks.lv | |
| 30. | SIA Latgales druka | Printing of other publications | 18.12 | Baznīcas 28, Rēzekne, LV-4601 Phone +371 64607276 Fax +371 64625938 druka@druka.lv | |
| 31. | SIA Latgales logs | Production of plastic construction elements | 22.23 | Strādnieku šķērsstreet 5/1, Rēzekne, LV-4604 Phone +371 29420510 | |
| 32. | RSEZ SIA DFD | Brewing industry | 11.05 | Atbrīvošanas alley 162a, Rēzekne, LV 4601 Phone +371 65410017, +371 65407097, +371 64622341 | |
| 33. | SIA ProMold | Production of other machines | 28.49 | Maskavas street 28B, Rēzekne, LV-4604 Phone +371 64607701 | Introduction of light reflectors in production 2.1.2.2.2. Design of new products and technologies – support for introduction of new products and technologies in production process, 2009. |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|--------------------------------|-------------------------------------|--|-------------|---|---------------------------------------|
| Latgale region counties | | | | | |
| Interviewed companies | | | | | |
| Ciblas county | | | | | |
| 34. | SIA Felicianovas rūpnīca „Polimērs” | Production of plastic panels, sheets, pipes and profiles | 22.21 | Felicianova, Ciblas p., Ciblas n., LV-5709 Phone +371 29135363 | |
| Līvānu county | | | | | |
| 35. | SIA PM Grupa | Wholesale of chemicals | 46.75 | "Lūsēni", Mežvidu pagasts, Krāslavas county, LV-5725 | Rubber element factory in the |

⁶³ Information available on www.esfondi.lv, 2007 – 2013 planning period

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|------------------------|---|---|-------------|---|---|
| | | | | Phone +371 67320102 | pecially supported territory 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2010 |
| 36. | SIA Future Electronics | Wholesale of electronical appliances, telecommunication appliances and components | 46.52 | Rīgas street 75, Līvāni, LV-5316 Phone +371 26496777 | Centre for operative analysis of elementary composition of different object 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2010 |
| Rēzeknes county | | | | | |
| 37. | RSEZ SIA Verems | Production of plywood sheets and wooden panels | 16.21 | „Lejas Ančupāni”, Vērēmu pagasts, Rēzeknes county, LV 4604 Phone +371 67067326 info@finieris.lv | |
| 38. | RSEZ SIA LEAX Rēzekne | Production of parts and accessories for mechanical vehicles | 29.32 | „Tēviņi”, Ozolaines pag., Rēzeknes raj., LV – 4601 Phone +371 67490954 | |
| 39. | RSEZ SIA Rigamet | Production of steel pipes, hollow profiles and connections | 24.2 | „Ezerkalni”, Meļņova, Vērēmu pagasts, Rēzeknes county, LV 4604 Phone +371 26656613 | |
| 40. | VSIA Latgales novada rehabilitācijas centrs „Rāzna” | Greenhouse operation | 86.1 | Veczosna, Sauču kalna 3, Lūznavas p., Rēzeknes n., LV-4627 Phone +371 64646488 +371 64646920 | |
| 41. | SIA Latpower | Production of mineral fertilizers and nitrogenous | 20.15 | "Akmeņlaiks", Mākoņkalna pagasts, Rēzeknes county Phone +371 29212701 | Establishment of sapropel extraction and |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|-----------------------------------|--|---|-------------|--|---|
| | | compounds | | latpower@inbox.lv | processing plant for production of nitrogenous soil supplement 2.1.2.2.2. Design of new products and technologies – support for introduction of new products and technologies in production process, 2011. |
| 42. | Thermeko | Non-classified industry | 32.99 | Masti-1, Mākoņkalna pagasts, Rēzeknes nov. Phone +371 67469181 Fax +371 67469183 info@thermeko.lv | Establishment of a new plant for production of thermal insulation material 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2010 |
| Viļānu county | | | | | |
| 43. | AS Viļānu selekcijas un izmēģinājumu stacija | Mixed agriculture | 01.5 | Viļānu nov., Viļāni, Rīgas street 44, LV-4650 Phone +371 64662690 Fax +371 64662690 | |
| Other companies identified | | | | | |
| Balvu county | | | | | |
| 44. | AS Balvu Maiznieks | Baking industry; production of fresh pastries and cakes | 10.71 | Liepu street 3 Balvi, LV-4501 Phone +371 64521795 Fax +371 64581776 maiznieks@sveiks.lv | |
| 45. | SIA Balviflora | Peat production | 08.92 | Skaidnis, Balvu p., Balvu n., LV-4561 Phone +371 29435099 | Acquisition of peat substrate production lines 2.1.2.2.2. Design of new products and technologies – support for |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|--------------------------|---|---|-------------|---|---|
| | | | | | introduction of new products and technologies in production process, 2011 |
| 46. | SIA Agroserviss B | Sawing, planing and impregnation | 16.1 | Vidzemes street 7 Balvi, LV-4501 Phone +371 64521051 Fax +371 64521318 agroserviss@apollo.lv | |
| 47. | SIA Rūfijs | Sawing, planning and impregnation | 16.1 | Kurna, Kubulu p., Balvu n., LV-4566 Phone +371 26386426 | |
| Daugavpils county | | | | | |
| 48. | AS Daugavpils dzirnavnieks | Production of feed for farm animals | 10.91 | Stropi, Dzirnavnieks, Naujenes p., Daugavpils n., LV-5413 Phone +371 65447370 Fax +371 65447347 dzirnavnieks@piedaugavinas.lv | |
| 49. | SIA Žabo | Production of meat and poultry meat products | 10.13 | Papušina, Kalkūnes pag., Daugavpils nov., LV-5449 Phone +371 65424458 | |
| 50. | AS Latgales bekons | Pig breeding | 01.46 | Vīganti, Višķu p., Daugavpils n., LV-5481 Phone +371 65471535, +371 65417535 | |
| 51. | SIA VVV Komunikācijas | Construction of power supply and telecommunication systems | 42.22 | Daugavpils nov., Naujenes pag., Krauja, Daugavas street 34B, LV-5451 Phone +371 67818107 | |
| 52. | SIA Daugavpils Eksperimentālā rūpnīca | Tools | 29.7 | Randene, Muižas 1, Kalkūnes p., Daugavpils n., LV-5449 Phone +371 65474827 | |
| 53. | Skrudalienas pag. zemnieku saimniecība „Šuriks” | Cereal (except for rice), legume and oil plant seed growing | 01.11 | Silene, Skrudalienas pagasts, Daugavpils county, LV-5470 Phone +371 65477540 | Many noticed on iub.gov.lv |
| 54. | SIA LC Plast | Production of other plastic products | 22.29 | Daugavpils nov., Kalkūnes pag., Kalkūni, Komunālā street 71, LV-5449 Phone +371 654 74455 Fax +371 654 74496 Mob.Phone +371 29513220, +371 22020025 | |
| 55. | SIA Meliors Krauja | Construction site preparation | 43.12 | Krauja, Daugavas 31, Naujenes p., Daugavpils n., LV-5451 Phone +371 65430295 Fax +371 65430298 Meliors.krauja@inbox.lv www.meliors.lv | Establishment of fractioned peat production plan in Daugavpils region 2.3.2.2. Support for investments in |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|------------------------|------------------|--|-------------|--|---|
| | | | | | micro, small and medium enterprises in specially supported territories (SST), 2009 |
| 56. | SIA SVM Metāls | Metāla konstrukciju un to sastāvdaļu ražošana | 25.11 | Muitas street 1, Muiņas, Kalkūnes pag., Daugavpils nov., LV-5449 Phone +371 65422000 | Development of SIA "SVM Metāls" production facilities 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2010 |
| Kārsavas county | | | | | |
| 57. | SIA Ekobriketes | Production of other wood products; production of cork, straw and wicker products | 16.29 | Malnavas street 47, Kārsava, Kārsavas nov., LV-5717 Phone +371 26411975 | |
| 58. | SIA Timber Impex | Production of other wood products; production of cork, straw and wicker products | 16.29 | Malnavas street 39, Kārsava, Kārsavas nov., LV-5717 Malnavas street 39, Kārsava, Kārsavas nov., LV-5717 | Start-up of fuel production of SIA TIMBER IMPEX 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2010. |
| 59. | SIA K.e.s.7 | Post-harvest auxiliary activities | 01.63 | Raiņa street 26C—2, Daugavpils, LV-5401 Phone +371 67481592 | Establishment of contemporary woodchip factory in Daugavpils region, Saliena county 2.3.2.2. Support for investments in micro, small and medium enterprises in specially |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|-------------------------|---------------------------|--|-------------|---|---|
| | | | | | supported territories (SST), 2010 |
| 60. | SIA Vilpe | Wholesale of timber products, construction materials and plumbing fixtures | 46.73 | Alejas street 13, Kārsava, Kārsavas county Phone +371 26296969 | Establishment of rubber roof gland element factory in the specially supported territory 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2010 |
| Krāslavas county | | | | | |
| 61. | AS Krāslavas piens | Dairy and cheese industry | 10.51 | Izvaltas 2, Krāslava, Krāslavas n., LV-5601 Phone +371 65624091 Fax +371 65624137 | |
| 62. | SIA Varpa | Production of woodworker and carpentry products | 16.23 | Vecborne, Kaplavas p., Krāslavas n., LV-5668 Phone +371 65626653 Fax +371 65681302 info@varpa.eu | Improvement of competitiveness of SIA "Varpa" by extending the assortment of garden furniture products and by reducing production costs 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2009 |
| Līvānu county | | | | | |
| 63. | SIA Z-Light | Production of optic fibre cables | 27.31 | Celtniecības 8, Līvāni, LV-5316 Phone +371 65307175 | |
| 64. | SIA Līvānu kūdras fabrika | Peat extraction | 08.91 | "Vāge", Soltumi, Rožupes pag, Līvānu nov., LV-5316 Phone +371 65307124 Fax +371 65307123 info@livanukudra.lv | |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|----------------------|-------------------------------|---|-------------|---|--|
| 65. | SIA Līvānu mājas un logi | Production of woodworker and carpentry products | 16.23 | Celtniecības 2, Līvāni, Līvānu n., LV-5316 Phone +371 65343330 Fax +371 65344728 lml@apollo.lv | |
| 66. | SIA Saltums 2 | Ice-cream production | 10.52 | Celtniecības 2a, Līvāni, Līvānu n., LV-5316 Phone +371 65344665 | |
| 67. | SIA Līvānu bioķīmiskā rūpnīca | Leasing and management of own or rented real estate | 68.2 | Līvānu nov., Līvāni, Celtniecības street 8, LV-5316 Phone +371 29419405 | |
| 68. | SIA Zelta zeme | Wholesale of chemicals | 46.75 | Fabrikas street 2b, Līvāni. Latvija, LV-5316 Phone +371 65307124 | Establishment of fractioned horticultural peat production plant in Līvāni region 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2009 |
| 69. | SIA Daugulis & partneri | Production of dried bread and biscuits; production of long-keeping pastries and cakes | 10.72 | Celtniecības street 1, Iesalnieki, Jersikas pag., Līvānu nov., LV-5316 Phone +371 65341650 Fax +371 65341650 daugulisunpartneri@inbox.lv | Extending the pastry factory and material change of production process in Līvāni region 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2009 |
| 70. | SIA Līvānu karbons | Production of other organic chemical elements | 20.14 | Murjāņu street 20—7, Rīga, LV-1024 +371 67842737 +371 67275253 info@livanucarbon.lv www.livanucarbon.lv | |
| Ludzas county | | | | | |
| 71. | SIA Ariols | Production of ready-made food | 10.85 | Rūpniecības 14a, Ludza, LV-5701 | Construction of production |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|----------------------|---------------------|--|-------------|--|---|
| | | | | +371 65707227 +371 65707225 www.ariols.lv | building and plant acquisition 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST), 2009 |
| 72. | SIA Ludzas maiznīca | Bread industry; production of fresh pastries and cakes | 10.71 | Dagdas 17, Ludza, Ludzas n., LV-5701 Phone +371 65707358 ludzasmaize@inbox.lv | |
| 73. | SIA Gammaplasts | Production of plastic packing | 22.22 | Kandavas str. 14b, Rīga, LV-1083 (īsteno projektu ražotnes izveidei Ludzā) Phone +371 67460330 Fax +371 67467580 info@gammaplast.lv | Extending the operation of the enterprise 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2009 |
| 74. | SIA Tradīcija AOL | Meat processing and conservation | 10.11 | Rūpniecības street 20, Ludza, Ludzas nov., LV-5701 Phone +371 65707225 | Establishment of a new ready-made food and semi-finished product factory 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2010 |
| Preiļu county | | | | | |
| 75. | AS Preiļu siers | Dairy and cheese industry | 10.51 | Daugavpils street 75, Preiļi, Preiļu nov., LV-5301 Phone +371 65307047 Fax +371 65321402 | |
| 76. | SIA ARHEO | Architectural services | 71.11 | Liepājas 44, Preiļi, Preiļu county, LV-5301 Phone +371 26607410 | Establishment of charcoal factory of SIA "ARHEO" |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|------------------------|-------------------|--|-------------|--|--|
| | | | | | 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2008 |
| 77. | SIA Galdniecība A | Production of woodworker and carpentry products | 16.23 | Kalnu 2/3, Preiļi, Preiļu n., LV-5301 Phone +371 26540610 Fax +371 65324149 galdniecibaa@inbox.lv | Modernization of carpentry factory of SIA "Galdniecība A" 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2008 |
| 78. | SIA A3 Projekts | Production of wooden containers | 16.24 | Ludzas nov., Brīgu pag., Brigi, "Mežāres", LV-5707 Phone +371 29193750 | Development of carpentry factory 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2008 |
| Rēzeknes county | | | | | |
| 79. | SIA Ceļi un tilti | Construction of roads and highways | 42.11 | Miera street 5, Čornaja, Čornajas pagasts, Rēzeknes county, LV-4617 Phone +371 64623581 Fax +371 64623581 ct@rezekne.lv | |
| 80. | SIA Nedbaltik | Production of industrial cooling and ventilation equipment | 28.25 | Atbrīvošanas alley 167, Rēzekne, LV-4604 Phone +371 67501707 Fax +371 67501710 info@evr.lv | Construction of ventilation and air conditioning equipment factory 2.1.2.4. High added value investments 2010. |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|-----|-----------------------|---|-------------|--|---|
| 81. | SIA Baltic BS Company | Non-classified engineering construction | 42.99 | Mazā Spulgu street 3—18, Mārupe, Mārupes nov., LV-2167 (ražotnes izveide Rēzeknes novadā) Phone +371 26598689 | Establishment of plant for production of sports and recreational field equipment 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2010 |
| 82. | SIA Nomis | Sawing, planing and impregnation | 16.1 | Malta, Maltas pag., Rēzeknes nov., LV-4630 Phone +371 64637703 | Extending the wood processing plant of SIA Nomis 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2010 |
| 83. | SIA TELLS | Production of other machinery | 28.49 | "Bernati", Audriņu pagasts, Rēzeknes county, LV-4611 Phone +371 29224766 | Acquisition of production machines for modernization of the metal working plant of SIA "TELLS" 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2009 |
| 84. | SIA NOOK serviss | Mechanical processing | 25.62 | Noliktavu street 10, Ratinīki, Vērēmu pagasts, Rēzeknes county, LV-4604 Phone +371 28629019 | Extending the metal working plant and diversification of production 2.3.2.2. Support for investments in micro, small and |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|-----------------------|--|---|-------------|--|--|
| | | | | | medium enterprises in specially supported territories (SST) 2010 |
| 85. | SIA Paletten Group | Silviculture and other forestry activities | 02.1 | Dzeņi, Pesčanka, Bērzgales pag., Rēzeknes nov., LV-4612 Phone +371 64622412 | Establishment of new palette production line 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2010 |
| Riebiņu county | | | | | |
| 86. | SIA Daugavieši | Mixed agriculture | 01.5 | Saules street 8, Riebiņi, Riebiņu pag., Riebiņu nov., LV-5326 Phone +371 64646316 | |
| Viļānu county | | | | | |
| 87. | AS Lopkopības izmēģinājumu stacija „Latgale” | Mixed agriculture | 01.5 | Brīvības 48, Viļāni, Viļānu n., LV-4650 Phone +371 64665723 | |
| 88. | SIA Kņavas granulas | Electricity production | 35.11 | Radopole, Kņava, Viļānu p., Viļānu n., LV-4650 Phone +371 29208844 | |
| 89. | SIA GSOL | Production of textiles for technical and industrial use | 13.96 | Rīgas street 45A, Viļāni, Viļānu county LV-4650 Phone +371 29664181 | Acquisition of equipment for the establishment of a new plant 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2009 |
| 90. | SIA Almann | Production of metal structures and components | 25.11 | "Lapas", Viļānu pagasts, Viļānu county, Latvija, LV-4650 Phone +371 26599393 | Establishment of bent metal product and structure factory in a specially supported |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶³ |
|-----|------|-----------------|-------------|----------|--|
| | | | | | territory 2.3.2.2. Support for investments in micro, small and medium enterprises in specially supported territories (SST) 2010 |

Potentially innovative enterprises in Utena region.

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶⁴ |
|-----------------------------------|---|---|-------------|--|--|
| Interviewed companies | | | | | |
| 1. | UAB Hoda | Production of plastic packing | 22.2 | Verbiškės, LT33331 Molėtų reg. amotra@post.omnitel.net Phone +370 (383) 43949 | |
| 2. | UAB Seifuva | Production of pre-fabricated metal products | 25 | Pramonės g. 7, 28216 Utena info@seifuva.lt Phone +370 8-389-69472 | |
| 3. | UAB Umaras | Production of plastic packing | 22.22 | Pramonės g. 19A, Utena LT-28216 info@umaras.lt Fax + 370 389 66001 Phone +370 389 66004, +370 389 66003 | Projects "Flexographic printing equipment installation to improve UAB UMARAS efficiency" (the VP2-2.1-um-01-C-02-128). "Facilitation of UAB Umaras productivity and international competitiveness through the introduction of modern command and control system" |
| 4. | AB Utenos trikotažas | Production of knitwear products | 13 | J.Basanavičiaus g. 122, LT-28214 Utena utenos.trikotazas@ut.lt www.utenostrikotazas.lt Phone +370 389 51445 | |
| Other companies identified | | | | | |
| 5. | Valstybės įmonė Ignalinos atominė elektrinė | Electricity production | 35.11 | Drūkšinių k. Visagino sav. LT-31500 Visaginas Phone +370 386 28985 Fax +370 386 24396 iae@iae.lt | „Intermediate assessment of energy storage technologies“ „Possibilities of solid waste management and storage“ „Dismantling of turbine equipment“ „Demolition of production plant“ „Demolition of boiler house“ „Establishment of |

⁶⁴ Information available on www.esfondi.lv, 2007 – 2013 planning period

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶⁴ |
|-----|----------------------|--|-------------|--|---|
| | | | | | waste deposit area for short-cycle waste” „Overground storage for low and medium level short-term radioactive waste” „Demolition of reactors” |
| 6. | UAB Utenos alus | Beer industry | 11.05 | Pramonės 12, LT-28500, Utena info@utenosalus.lt | |
| 7. | AB Anykščių vynas | Beverage industry | 11 | Dariaus ir Girėno g. 8, 29131 Anykščiai Phone +370 381 50233 Fax +370 381 50350 info@anvynas.lt | |
| 8. | UAB Visatex | Textile industry | 13 | Taikos pr. 25, LT-31217 Visagina Phone +370 38650009 Fax +370 38672766 | |
| 9. | UAB Bikuvo prekyba | Wholesale brokerage of timber materials and construction materials | 46.13 | <u>Užpalių g. 81, LT-28198 Utena</u> <u>dalius.sirvys@bikuva.lt</u> Phone +370 601 77276 | |
| 10. | UAB Nagisa | Production of plastic packing | 22.22 | Utenos r. sav. Utenos m. Molėtų g. 88 Phone +370 61142077 Fax 370 38961807 | |
| 11. | UAB Utenos Mėsa | Meat product industry | 10.1 | Pramonės gatvė 4 Utena LT-28216 mesa.ab@utena.omnitel.net Phone +370 389 51877 | |
| 12. | AB Vienybė | Production of office equipment | 28.23 | Kauno G. 120 Ukmerge LT-20115 Phone +370 340 63516 <u>vsenukai@vienybe.lt</u> | |
| 13. | Ignalinos pieninė | Dairy industry | 10.5 | Taikos g. 20, LT-4740, Ignalina <u>Ignalinos.pienine@is.lt</u> Phone 370 38652389 | |
| 14. | UAB Anykščių Vosinta | Meat product industry | 10.1 | Sausalaukės k., 29345 Anykščių r. <u>vosinta@is.lt</u> Phone +370 38157400 | |
| 15. | UAB Utenos Indra | Printing house | | Maironio g. 12, Utena LT-28143 <u>www.indra.lt</u> Phone +370 869849566 <u>spauda@indra.lt</u> | |
| 16. | UAB Akadas | Production of | 16.2 | Šaltupės g. 86, LT-32117 | |

| No. | Name | Industry sector | Sector code | Contacts | Implemented EU projects ⁶⁴ |
|-----|--------------------------------|---------------------------------------|-------------|---|---|
| | | wood, cork, straw and wicker products | | Zarasai info@akadas.lt Phone +37038551383 | |
| 17. | UAB Visagino atominė elektrinė | Electricity production | 35.11 | Žvejų g. 14, LT-09310 Vilnius Phone +370 52782998 info@vae.lt | |
| 18. | Visagino Linija | Furniture production | 31.0 | Karlų k., LT-30270, Visagino sav. info@sbaifurniture.lt Phone + 370 46401536 | The project co-financing for administrative, technical, maintenance and warehouse buildings construction, for purchase of machinery and equipment and management systems. |

Questions of the interviews with business representatives

Information on the company

1. Target market of the company – local or export;
2. Has the company introduced new products and technologies during the recent 5 years?
 - ❖ **If so:** has the company itself participated in the design of the products and technologies, carried out or commissioned studies?
3. Which have been the cooperation partners of the company to design and implement the products? (higher education institutions, technological parks, scientific institutes, scientists, etc.)
 - ❖ **If not:** what are the main reasons for not doing it.
4. Does the company plan to introduce new products and technologies? Is it prepared to invest in research and development:
 - ❖ **If so:** does the company plan to participate itself in the design of the products and technologies, carry out or commission studies?
5. Which are the perspective cooperation partners of the company for the design and introduction of the products?
 - ❖ **If not:** what are the main reasons why this is not intended? What is hindering investments in research and development?

Business environment

6. In your opinion, what are the main preconditions for successful business development in Latgale (Utena) region?
7. In your opinion, what are the main advantages of Latgale (Utena) region in Latvian (Lithuanian) and European area, which makes it a convenient place for business establishment?
8. What are the main criteria for the investors causing them to make decision in favour of establishing business and investing in Latgale (Utena) region?
9. In your opinion, which are the most important sectors for the development of Latgale (Utena) region? Is there any sector which has not been developed currently, but which has a high potential for future growth? What indicates of such potential?

Innovations and research

10. In your opinion, does Latgale region (Utena region) have a favourable environment for the innovation development and research?
11. In your opinion, what should be done to encourage creation of new ideas, business growth, developing new products and technologies?
12. In your opinion, in which fields the promotion of research would be efficient in Latgale region (Utena region)?

Human resources

13. Do you think that the educational opportunities in Latgale region are adequate?
 - ❖ **If not:** why, what is missing?

14. Does the available labour force comply with the needs of your company?

❖ **If not:** why, what is missing?

Cooperation within border region

15. Do you currently have cooperation partners (suppliers, customers....) in Lithuania, Utena region (for the company representatives from Lithuania – in Latvia, Latgale)? Have you planned any cooperation?

16. How do you rate in general the current economic cooperation between Latgale and Utena regions?

17. Do you think that cooperation is necessary?

❖ **If not:** why?

❖ **If so:** what could encourage it?

Questions of the interviews with representatives of scientific institutions

Information on the research institution (if applicable):

1. What are the main fields you are working in? (fundamental research, industrial research, ...)
2. How do you rate the capacity of your research (infrastructure, human resources, results)? What should be improved?
3. Do you mainly use in-house scientists/researchers, or involve any outside resources?
4. Do you cooperate with other scientific institutions, higher education institutions? How could it be improved?
5. Do you have international activities/cooperation partners?
6. Do you have patents or have you tried to commercialize them?
7. Do you cooperate with companies, business incubators? How? Do you use any of the existing mechanisms (for example, technology transfer, measures)? How could it be improved?

Innovations and research environment:

8. Do you think that Latgale region has a favourable environment for innovation development and research?
9. How do you rate the current mechanisms for commercialization of research results? How could these be improved?
10. In your opinion, what are the main advantages of Latgale region in Latvian and European area, which makes it a convenient place for research and science development?
11. In your opinion, which are the most important sectors for the development of Latgale region? Is there any sector which has not been developed currently, but which has a high potential for future growth? What indicates of such potential? Do you see possibilities of clusters in any sector?
12. In your opinion, in which fields the promotion of research would be efficient in Latgale region?
13. In your opinion, what should be done to encourage creation of new ideas, business growth, developing new products and technologies?

Human resources:

14. Do you think that the educational opportunities in Latgale region are adequate?
❖ **If not:** why, what is missing?
15. Is the scientific human-capital capacity sufficient?
❖ **If not:** why, what is missing?

Cooperation within border region:

16. Do you currently have cooperation partners in Lithuania? Utena region? Have you planned any cooperation?
18. Do you think that cooperation is necessary?
❖ **If not:** why?
❖ **If so:** what could encourage it?

Objectives

1. Setting up objectives

| Objective | Why it is important? |
|-----------|----------------------|
| 1. | |
| 2. | |
| 3. | |

1. The list of potential objectives made by the experts

- ❖ To establish internationally competitive research institutions oriented toward excellence in research, technologies and innovations.
- ❖ To recruit new scientists and technologically oriented talents to educational and research institutions and innovative enterprises of Latgale region thus improving the innovation capacity of Latgale region.
- ❖ To increase the number of innovative, technologically oriented and export capable enterprises in Latgale region.
- ❖ To improve the cooperation of universities, research institutions and enterprises to ensure research for commercial purposes and to encourage the capacity of the enterprises of Latgale region to create technologically innovative products and services.
- ❖ To create business culture in Latgale region oriented towards innovations and creativity.
- ❖ To create globally competitive innovative products and services by using the resources available in the region..

Resources and tools

1. Choosing resources and tools

| | |
|---|---|
| Objective 1 | |
| Main resources: 1. 2. 3. | Main instruments: 1. 2. 3. |
| Objective 2 | |
| Main resources: 1. 2. 3. | Main instruments: 1. 2. 3 |
| Objective 3 | |
| Main resources: 1. 2. 3. | Main instruments: 1. 2. 3. |

2. List of main resources elaborated by experts

Educational resources

1. Widely available professional education in different fields:

- ❖ Commerce, accounting
 - ❖ Creative industries (music, art)
 - ❖ Mechanical engineering, metal working
2. Widely available Bachelor and Master studies both in Daugavpils University and Rēzekne Higher Education Institution and the branches of other higher education institutions:
 - ❖ Social sciences (economics, law, business management)
 - ❖ Mathematics and natural sciences (chemistry, physics, environmental sciences)
 - ❖ Computer sciences and IT
 - ❖ Engineering sciences (science of electricity, mechanics and mechanical engineering, transport)
 3. Widely available Doctor studies, including:
 - ❖ Mathematics, biology, solid-state physics
 - ❖ Economics
 - ❖ Computer sciences and IT
 - ❖ Environmental science
 4. The only branch of the Academy of Art outside of Riga is located in Rēzekne

Research resources

1. Innovative Microscopy Centre of Physics Department of Daugavpils University – one of the most advanced laboratories in Latvia – enables studying live organisms at the cellular level, obtaining information about biological systems in the cells.
2. The only centre for production of plastic product prototypes and the laboratory of chemical and physical testing of the components and raw materials in the Baltic is located Rēzekne Science and Technology Park.
3. Rēzekne Higher Education Institution in cooperation with Latgale Machinery and Technology centre provides a modern mechatronics laboratory.
4. The Institute of Physical Research and Biomechanics with specialization in laser physics, power engineering, optical science.
5. Latgale Agricultural Science Centre with specialization in agronomy, zootechnics, selection.
6. Technology transfer office of Rēzekne Higher Education Institution.
7. Technology transfer office of Daugavpils University.
8. The institutes of the higher education institutions carry out research in the following fields:
 - ❖ systematic biology

- ❖ modelling of the qualities and physical processes of substances and materials
- ❖ alternative energy, ecology
- ❖ social sciences
- ❖ humanitarian sciences
- ❖ mathematics
- ❖ art
- ❖ sustainable development and regional development

9. Rēzekne Science and Technology Park

Business resources

1. Enterprises of Latgale region have successfully specialized in the following fields:
 - ❖ metal working
 - ❖ food and beverage industry
 - ❖ light industry
 - ❖ woodworking
 - ❖ chemical industry
 - ❖ mechanical engineering
2. Relatively cheap labour force.
3. Good possibilities for extending the territorial location of production plants.
4. Tax allowances for investment projects.
5. Relatively better opportunities to attract EU co-financing for enterprise projects.
6. Business support mechanisms:
 - ❖ Līvāni Engineering technology and innovation centre
 - ❖ Innovation centre of Rēzekne Higher Education Institution
 - ❖ Creative Service Centre of Eastern Latvia's Municipalities

Other resources

1. Proximity of Russian and Belorussian markets
2. Knowledge of Russian language
3. Rēzekne special economic zone
4. Former military airport of Daugavpils
5. Five railroad lines and important highways
6. Territories of former factories

3. List of main tools elaborated by the experts

Creation of external environment to encourage research and technology development

1. Encouragement of general creativity
2. Improvement of infrastructure, competence and prestige of the research institutions

3. Recruiting of new talents to research
4. Environment encouraging business start-up and development
5. Organized infrastructure
6. Creation of the region's image

Use of the existing scientific potential

1. Cooperation platforms to encourage research for business needs
2. Protection and commercialization of the intellectual property of the scientific institutions
3. Availability of information on the current research resources and study results, understanding of the encouragement of research processes among entrepreneurs
4. Development of business skills among students, scientists and researchers of different fields
5. Encouraging cooperation between novice entrepreneurs and research institutions

Client commissioned research

1. Focusing on fields with high added value, essential proportion of highly qualified labour force, development and market growth potential
2. Involvement of enterprises in the planning of research activities – support for performance of market oriented studies
3. Recruiting of highly qualified specialists to commercial enterprises, to address specific technological problems and to develop new products
4. Studying, promoting and introducing of best practices in enterprises in the innovation and technology fields
5. Cluster creation
6. Using of EU co-financing for research and technology transfer
7. Research and innovation competence in state and municipal procurements
8. Use of professional design in industrial enterprises, thus increasing the added value of the products and the international competitiveness

Integration into the global research and business area

1. Access to international research and innovation resources, cooperation networks, experience exchange (both for enterprises and research institutions)

2. Monitoring of market trends and technology development in priority and perspective fields
3. Participation in international research projects (both for enterprises and research institutions)
4. Encouraging foreign enterprise interest in the research and development services available in Latvia
5. Research in the EU priority fields
6. Procurement of research and development services and transfer of technologies from foreign countries, including holding companies
7. Cross-border cluster programs and contact networks.

Activity plan

| | |
|--------------------|----------------------------------|
| Objective 1 | |
| Activity 1 | Description and expected results |
| Activity 2 | Description and expected results |
| Activity 3 | Description and expected results |
| Objective 2 | |
| Activity 1 | Description and expected results |
| Activity 2 | Description and expected results |
| Activity 3 | Description and expected results |
| Objective 3 | |
| Activity 1 | Description and expected results |
| Activity 2 | Description and expected results |
| Activity 3 | Description and expected results |