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KALININGRAD REGION: THE BEST PRACTICE OF CREATING PREREQUISITES TO THE INNOVATION DEVELOPMENT

This article considers the current state of the innovation development on the territory of Kaliningrad region its agents, main fields of operation, problems and perspectives.

The major constraints to the innovative development of Kaliningrad region are held to be institutional: the dependence of the regional economy on the political and administrative controls of the federal center; the excessive government role in the regulation of economic processes, while there is no protection from the economic risks associated with doing innovative entrepreneurship; the strategic uncertainty regarding the future of the region.

Among the key agents of the innovation development, the article identifies three groups of the innovation entities: large companies, government and universities.

Generally, in the region, after a period of decreased cooperation activity of the regional authorities with the universities there is a marked trend towards the development of cooperation.

The interaction of the entities of the innovative activity in the region is currently at the stage of institutionalization: entities select the best practices, define organizational formats of the interaction, develop conventional forms of cooperation and formalize them.

To sum up, the paper offers a set of practical measures to promote innovative development in the region.

Key words: innovation development, innovative activity, scientific infrastructure, market, demand, key agents, investment, regional policy.

Kaliningrad region has a great potential in the development of innovations: the regional development covers the automobile industry, the industries of electrical equipment, pulp and paper, textile and food industries, production of fuel and energy resources, production and distribution of electricity. Some companies of food processing and textile industries have experience in implementing organizational innovations. The region has scientific, educational and material resources for the development of R&D sector; the region has the third highest ratio of inventive activity in the regions of the North-West Federal District of the Russian Federation.

There are also favorable external conditions: developed industries of wood processing, production of electrical equipment, energy production on the potential markets-neighboring Latvia, Lithuania, and Estonia; high demand for research and development in the European market; possibility of simultaneous penetration of a large volume Russian market and the European markets.

Kaliningrad universities are included in the European programs of academic and student mobility (e.g. ERASMUS), have the ability to adopt innovations of the EU leaders (Germany, Sweden, Denmark, Norway and Finland) in the field of medicine and biotechnology, electrical equipment, energy, metal processing and engineering, have developed communication with the German partners in the field of physics, chemistry and materials science.

However, there is a number of negative trends and objective constraints to the innovative development of the region. That is a low level of innovative activity of the enterprises (3% of the total number of enterprises), the almost complete absence of the units engaged in R&D at the enterprises, and low level of private capital expenditure on technological, marketing and organizational innovations. Those expenditures on innovation, which are carried out by the local companies are mostly characterized by the purchases of machinery and equipment related to the technological innovation, while the sector of research and development is clearly lacking investments.

There are objective human and infrastructural problems: low wages, aging and decrease in the number of employees in the sector of research and development, low innovation capacity of organizations and the lack of qualified personnel.

Moreover, the external conditions are not always favorable in nature: the Baltic Sea countries have developed competitive innovation economies, partly due to this fact there is a lack of interest for the foreign capital investments in innovations in the region. The demand for research and development in the Russian Federation is also low.

The negative impact is partly due to the institutional factors: the uncertainty of federal policy and dependence of the regional policy regarding the decision making and formulation of the regional economic policy; the structural and institutional limitations of the Russian economy, which are: the excessive state intervention, braking the dynamics of private sector and increasing the cost of investments; the non-tariff barriers, that increase trading costs; the bureaucratic hurdles, inconsistencies in the regulations; the lack of competition and constant rise in prices and tariffs; the low level of transparency and public accountability of the government spending; the low level of protection of economic interests and intellectual property of investors. Investors' concerns are caused by the so-called "Problem-2016", associated with the end term of the Law on Free Economic Zone in 2016 and cancellation of the related tax and customs privileges.

Thus, we see that the major constraints to the innovative development of Kaliningrad region are institutional: the dependence of the regional economy on the political and administrative controls of the federal center; the excessive government role in the regulation of economic processes, while there is no protection from the economic risks associated with doing innovative entrepreneurship; the strategic uncertainty regarding the future of the region. These and a number of other institutional features entail complex economic factors, expressed in the innovative behavior of companies (reluctance to exercise "long" investments, low innovation activity of enterprises, low level of R&D expenditures, etc.), and in decreasing HR innovation potential of the region (an increase in the average age of the personnel engaged in R&D sector, low wages, low number of people employed in research and development). A kind of "vicious circle" is formed, as an innovative industry with low quality of human capital is notable to meet the regional needs in innovation products, and the inflow into the sector of new skilled workers is not possible due to the low economic attractiveness of the sector for young and highly skilled workforce.

Today Kaliningrad region continues to operate on the basis of outdated scientific and technological infrastructure, incorporating elements of modern innovation

infrastructure, which, however, does not represent a complete system of innovative behavior and the development of the regional economy. Most of the parameters referenced to the essential criteria of the innovation development of the region show a tendency to decrease. Innovation technologies applied are in many ways oriented on short and medium term implementation, whereas funding for basic research is carried out by the federal and municipal budgets. The attention is drawn to the problem of wear of fixed assets of organizations that perform scientific research.

Among the most significant areas of uncertainty, forming risks for the innovative development of the region and that may have a serious impact on its prospects are:

- the strategic federal policy towards the region;
- institutional conditions applicable after the abolition of the customs and tax benefits in 2016;
- the volume and structure of the demand of the Russian and European market for innovative products and services;
- the growth rate of innovation potential of the major competitors among the Baltic Sea countries (Poland, Estonia, Latvia, Lithuania).

The current research is devoted to the more in-depth consideration of the existing resources, institutions, problems and prospects of the innovative development of Kaliningrad region in terms of the regional community. The following provisions are based on the research conducted by the Baltic branch of MION in the period from April to October 2012, where the extensive statistical data was analyzed describing the state of the regional innovation sector, and expert interviews with the representatives of the major stakeholders of innovation activity in the region. The study includes 25 interviews with the representatives of the relevant ministries of the regional government, technology transfer centers, research departments of universities, large, medium and small enterprises.

The work consists of three main parts: the first considers the existing institutional context of the innovation development, describes the actors of the innovation development, the forms of cooperation, the prospects and problems of the innovative development of the territory; the second part deals with the successful realization experience of the projects on the innovative development of the area with its main entities -universities, government and enterprises; in the third part the current level of readiness of the universities in the region to take on the role of the agents of the innovation development is analyzed, an assessment of their resources and potential areas of focus are given. At the end, the recommendations on the measures to stimulate the innovation development of the territory are made.

§1. The institutional context of the innovation development of the territory: forms, entities, problems

The main entities of the innovation activity in the region identify a number of key features of the regional innovation development concept. These include:

- Areas of highly competitive products production with high added value and low expenses;
- Technological modernization based on knowledge-based developments;

- Improving the quality of human capital (the emergence of highly qualified personnel) by social change;
- Capitalization of high technology developments (and the related positive aspects that impact the economy – job creation and increased tax deductions);
- Innovations that significantly alter the structure of management, production processes, or provide new properties to the products.

The participants rather distinctly distinguish between the concept of R&D and innovation, clearly focusing on the aspect of commercialization of scientific research, its distribution to the market in the form of goods or services.

Innovative development – is the introduction of new technologies in various areas of human activity. Innovation comes in three forms: 1. Economical 2. Technological and 3. Social. Technological – the introduction of new production methods, new models. Social – the most difficult – the introduction into the daily life of the new arrangements, principles, tools,

– **Deputy head of the unit of the University**

The following main directions are allocated for the innovative development of the region: medicine(biotechnology), information and communication systems, automotive, materials (nanomaterials), shipbuilding, tourism (innovation tourism cluster, including medical tourism), machinery, electronics and electronic instrumentation, furniture, fishing industry(including shipping and logistics), food (meat, dairy, fish, up to the tobacco production), energy (development of the Baltic NPP), the sphere of housing and communal services (application of the developments of the electronics and IT sectors), construction and industry waste (including waste).

1.1. The main agents of the innovation development

Among the key agents of the innovation development the respondents identified three groups of the innovation entities: large companies, government and universities.

1. Large companies

It might be noted that in some areas, which have already been highlighted as the main directions of innovative development of the region, the named companies are potential or real agents of the innovative development:

- OJSC "Avtotor", passenger car industry;
- OJSC "Yantar", shipyard;
- OJSC "Quartz", electronics and instrumentation;
- Design Bureau "Fakel", machinery and instrumentation;
- Small and medium-sized IT-companies (software development and gaming content for mobile phones).

At the same time, draws attention the fact that the innovation leaders were not named in the area of medicine and biotechnology, materials science, tourism, furniture industry, fishing industry, etc. This means that these industries do not have a clear leader of innovation activity, and generally, the sector is not ready to play the role of an agent of the innovation development. However, this statement can be equally attributed to some of the mentioned companies.

The specific role of enterprises in the innovation development, in the opinion of the regional community, can manifest itself in two respects: large business plays

the role of the **developer of innovations** (in the framework of their internal R&D departments) as well as the **subject of financing and implementation of the innovative developments**, while small business is considered one of the main entities of the implementation of innovations.

In addition, it is noted that business, predominantly industrial enterprises, plays an important role in **securing demand** not only for innovation developments but also for **innovative products**, and the development of "non-innovative" industries, thus, can serve as a powerful engine for the development of the innovation sector of the region.

2. Government. The leading role of the government is noted by nearly all representatives of the regional community. In their view, the government should provide a regulatory institutional framework for the effective management of the innovative activity, removing the administrative barriers, as well as promoting the formation of financial institutions that support R&D.

3. Universities. The representatives of the regional community emphasized that the universities should have the necessary competencies to develop innovations, first of all, those that have a technical specialization. In this regard, Kaliningrad universities are in fairly good position, since two of the three leading universities in the region have distinct technical focus—Kaliningrad State Technical University and the Baltic Fishing Fleet State Academy—and the third university, the Immanuel Kant Baltic Federal University, is a classical university and also includes a certain amount of technical specialties.

The necessity of participation in the innovative activities of the Russian research organizations' branches is underpinned.

At the same time, the innovators feel some "structural void"—the lack of institutional agents of the innovation development in one of the key areas:

Innovations are being implemented at the company level in many of our technology companies, in one way or another (as implementation of innovations is required to maintain competitiveness). Universities – the BFU, KSTU, BFFSA have gained a good potential. Unfortunately, the chain of financial agents of innovations is lost in the region.

– First Deputy Minister, Government

The financial agents in this context are defined not only as the scientific foundations that fund research and development, but also funds supporting small innovative enterprises, providing assistance at the stage of formation and bringing innovative ideas to the stage of commercialization.

The federal structures, such as "Rosnano", are not always able to provide effective support for the regional innovation due to the impact of the complexity of communication and organizational –administrative issues. According to the participants of the process, it is not enough regional funds and financial agents of innovations at this point.

According to the experts, none of the agents of the innovation development in the region implements its functions fully to date.

1.2. The main barriers for the innovative development

Administrative and bureaucratic barriers:

1. Problem: the complexity of the bureaucratic procedures. Complex procedures for tax reporting, reporting to the budgetary funds, Federal labor and employment service, Federal ecological, technical and nuclear inspection service. High administrative expenses inevitably reduce the investment attractiveness of potential developments and products.

Solution: simplification of economic activity legislation.

2. Problem: customs barriers. Problems of equipment and materials procurement for R&D, an increase of time and material costs for innovations, decrease in investment appeal of the R&D.

Solution: providing preferential customs regime for the entities of innovation.

3. Problem: the lack of effective legal mechanisms of organizational and financial support of innovations.

The mechanisms of interaction between authorities and science for the development of innovations are not developed until now; there is no program for innovative development in the region. There is no law that simply defines the procedure for financing, but without money, nothing is impossible. Examples of such countries as Sweden, Denmark, even Poland, show that it is a very important point. When the community understands the need of small innovative enterprises, it finds the support mechanisms. We do not have it yet.

Director of Information Technology Center

Solution: the adoption of normative acts governing innovation activity in the region, that determine the order of its financing and joint participation of various entities, shifting the R&D expenses from the category of "other expenses" to the category "fixed assets", issuing grants to enterprises that have a certain degree of innovative products in the total output.

At the same time, it should be noted that many representatives of the regional community (including business) emphasize that they see no administrative barriers, and they are rather held by economic considerations from investing in innovations.

Economic barriers:

4. Problem: lack of funding sufficient to ensure product competitiveness on a global scale. In terms of geographical and economic openness to the European and world producers, as well as due to difficulties of promoting local products on the Russian market, the regional companies are forced to endure a rather tough competition. For innovations to be in demand at least on the regional market, they need to be competitive at the highest level.

Solution: providing funding at the stage of manufacturing of testing samples, goods. Reduction in direct expenses of companies with occupation in innovative activities (including the provision of free or discounted use of information and communication resources).

5. High risks of innovation activity. Small and medium enterprises do not have sufficient available funds for investment into research and development. Large companies often prefer "raw materials" projects and "short" investments, as well as procurement of finished products abroad.

Solution: creation of programs of grant support for small innovative companies.

Structural barriers:

6. Problem: lack of infrastructure for the innovations development. In contrast to the European model (building technology parks in small towns, the EU co-financing of technoparks, by the country of the location, and private investors) the available innovation infrastructure facilities in the region are not the result of joint actions of the state, universities and businesses.

Solution: common trilateral design and development of organizational forms, which will be a platform for institutional practices of innovative cooperation.

We do not have this infrastructure and this mechanism: innovation and technology centers were built locally, and that was it. The region with million inhabitants does not have a business incubator, a technopark – as the one created in the IKBFU, is rather a science park. The region in general has no state budget support of innovation sphere. In the region there are industrial areas, there is science, but scientific knowledge does not reach the market, and without further investment of money and obtaining the products to enter the market – they are nothing.

– Director of Information Technology Center

If we are saying that commercial companies should give some sort of development to university – at the moment there is no one to give them to. We do not have such training at university, unfortunately, that a graduate would be ready to work fulltime, make money or run their own businesses. If the university had an information center, which receives orders, earns money... The point is that the university has specialists, which I do not have.

– Director of IT-company

7. The lack of effective communication between business and science: as the result business evaluates the risks of long-term investment too high, and science does not always accurately understand what they need to offer to the business, what the business needs. The opportunity of inter-organization communication with associated business entities (business association) is not exploited.

Solution: the establishment of communication platforms.

Industry often does not know that there is a block of people who could create some sort of scientific development. We meet with the industry only at forums that sometimes are organized by the regional government, but we never negotiate on anything. Of all the industrial partners in Kaliningrad region that we had attempts to work with were two brick factories, but it is a very low-level cooperation, which rarely even leads to financial contracts. We have not been formalized in any way; they do not have development programs that would force them to, for example, pay attention to the developments produced at universities.

– Scientist, University

There are no serious barriers for science to communicate with the local community. Just that parties withdraw into themselves and are not willing to engage in dialogue, we need competent moderator, able to translate the scientific language on business language and vice versa.

– OJSC "Corporation for Development of the Kaliningrad region"

There are no barriers, the demonstration platforms should be created. Businessmen – are busy people, they have a lot of operational ongoing affairs,

and they will not delve deeply, better to come and see. Therefore the idea of incubator is very relevant.

– Head of IT-company

There are fairly many associations in the Kaliningrad region: the association of entrepreneurs, the association of meat processors, furniture association and it is not necessary to meet with each one individually, you can simply meet with such associations and to understand what they need directly, what they are willing to cooperate in, at which part and in what ways.

– Director of the food processing industry company

8. Problem: Lack of trained personnel.

Solution: the development of practices of personnel training at the specialized enterprises.

University has to work better with professional members of the economy, with those who work; invite to lecture real-working economists, marketing experts, those who really work. Organize, for example, that during the day you can get together, conferences, on topics related to building your own business. Should teach the children to do their own business, that needs doing.

– Head of IT-company

9. Problem: the lack of technological development of many sectors of the regional economy: the development of innovative projects in one industry is often faced with a lack of technological development of other industries.

Solution: improve the overall technological development of the region.

1.3. Problems and prospects

Positive outlook:

The accession to the World Trade Organization, according to the representatives of the regional community, does not necessarily create problems for the development of innovations in the region. According to a number of our experts, the effect of the regulatory instruments of the WTO will, in particular, simplify the procedure of interaction with the European and international economic agents, and provide better protection of the intellectual property rights.

As always, great reliance is placed on the geographical factors: favorable position of Kaliningrad region, combined with the inclusion of the network of the institutional frameworks and economic ties will enable the area to become an open space for the execution of the European technology, exporter of high technology products, business and scientific tourism, international scientific and technological cooperation site for the development of projects, that did not find use in other countries for various reasons. The experts note a great export and innovation potential of the region, and the major prospects are seen in the development of the production with high added value. The development of scientific and economic cooperation with Poland, Germany, Lithuania and Belarus is expected and highly appreciated.

Great strategic significance will have the construction of the Baltic nuclear power plant, which will give impetus to the development of nuclear technologies like nuclear physics and nuclear medicine.

Among the sectors that in the long term will be able to provide the innovative development of the region, the representatives of the local community include:

- Materials;
- Medicine;
- Physics;
- Microelectronics;

The strategic importance in the region is acquired by the Federal University, the opening of which gives great expectations for the development of basic research in the fields of physics, medicine and microelectronics.

Potential problems:

The presence of universities, even of the fundamental and technical focus, however, does not guarantee the successful innovation development of the region. The representatives of the business community, for example, point out that we need to develop effective institutions and organizational forms of innovation activity. In particular, the creation of full-fledged university technoparks with the participation of private investors, which would ensure the commercialization of scientific research, employment of highly qualified personnel, the establishment of competitive innovative products – in other words, played the role of "anchors" in the innovative development of the territory. Otherwise, the "openness" of borders and free interaction with Europe could result in an outflow of intellectual resources from the region.

The shortage of the personnel, as we note, is generally considered to be one of the most serious problems today, and seriously limits the development of the innovation potential of the region. To date, according to the business community, universities are not yet ready to provide highly qualified staff for the regional economy and innovative enterprises in particular.

Some concern of the regional community is due to the lack of clearly defined and sustainable priorities for the development of the region, which automatically increases already high risks of investing in innovations.

Above all, the problem of the 2016, that marks the deadline for the implementation of law on the Special economic zone and, therefore, the termination of the customs and tax reductions for businesses – residents of the SEZ, is not seen as an unambiguous problem for the entities of innovation activity as it used to.

It is noted that at the time of adoption of this law it has allowed to solve the actual problems (employment, budget, competitiveness of many regional companies), but has largely limited the possibilities of the innovative development of the area: formed in the framework of existing institutional conditions the organizational models were oriented on the extraction of profits from the use of economic incentive sandaled to the growth of the companies engaged in assembly production, that are not interested in creating a new product.

The prospects of the European market is getting open to us, and the absolutely normal mechanism of competitiveness with European manufacturers and the companies that operate in the international market, in the global market, is activated. Therefore, enterprises should understand the need to prepare their equipment for the production of goods in a new way of development and with execution of new technologies, which consequently should lead to the recovery of our economy and, thus, innovative models should replace this preference, which was in this case, at the customs.

– Head of department, the regional Government

High hopes for the solution to this problem are associated with the strategic development of the economic sectors, which, after the removal of tax and customs privileges will allow enterprises not only to avoid losing their positions, but also to send pre-defined economic, labor and intellectual resources in new areas that can ensure the development of the region.

As for the companies directly involved in the development and introduction of innovative products, the problem of logistics and customs barriers is less acute to innovative companies than in traditional industries or agriculture, since the intellectual product itself does not require imports of tangible assets and the use of customs facilities.

On the other hand, large industrial companies, which are potentially the main consumers of the innovative products, will, inevitably, experience the impact of the abolition of customs and tax benefits. If the cancellation of the law on the special economic zone will increase the transportation and logistics costs of companies, and reduce competitiveness of their products, it is unlikely to expect an increase in budgets of the large private companies in research and development in the short term.

There is also a gap problem of the device-technical base in universities and enterprises. Significant financial investments in modernization of the IKBFU allowed to seriously increase the technical capacity of the university, but many companies do not have such a modern and sophisticated device-technical facilities. This potentially creates a problematic situation, where university graduates, trained to work on modern equipment with modern techniques, will be obliged to work in a company on outdated equipment, which will lead to demotivation of staff and the formation of migration preconditions. The solution to this problem lies in the development of instrumentation and technological base of companies, which can be achieved by incentives to purchase innovative equipment. It should be noted that it is the acquisition of innovative technical products for its introduction in the production processes of enterprises that is one of the most common types of innovative activities in the region at this time. In any case not limited to this type, it is necessary to support this trend.

The main threat to the innovative development of Kaliningrad region, that is seen by the regional community, in the unprepared regional economy (institutional, resource and personnel wise) to take the role of financing and implementing the R&D and innovative products.

§2. The positive experience of the regional innovative development projects realization

2.1. Institutionalized practices

The interaction of the entities of the innovative activity in the region is currently at the stage of institutionalization: entities select the best practices, define organizational formats of the interaction, develop conventional forms of cooperation and formalize them.

The Interaction of the university and the government.

To date, there are a number of sustainable forms of regulating interactions of universities and government in the innovative development of the region.

The first of them forms the various agreements and consultative bodies at the government, organizing the interaction with the representatives of the regional community, including the universities:

1. The agreement between the university and the government of Kaliningrad region, on the interactions concerning the formation of scientific research related to the economic development of the region.
2. Rector's Council, headed by the rector of the IKBFU A.P. Klemeshev, being able to communicate directly with the governor of the region.
3. Specialized advisory boards on various fields of social and economic activities in the regional government, which includes experts from the scientific and educational institutions.
4. Public Council of the Kaliningrad Regional Duma, headed by the vice-rector on science of IKBFU G.M.Fedorov, which gives overview of various initiatives of the regional community, including those relating to scientific and educational activities.
5. Interim Board on the strategy development of the amber industry until 2021, which includes the representatives of large business, government and universities.
6. Temporary working groups established to address certain specific tasks, of the government and universities interests.
7. Sectoral working groups, which bring together experts from the universities of the region.

As a potential area for development of cooperation between the government, the universities and the regional community, is cooperation on the adaptation of employment training programs for the regional economy needs.

The second type of institutions -are financial agents of innovation. This group includes public funds involved in the financial support of innovations. At present, this group includes only one fund, acting jointly with the regional government and academic institutions in the region:

1.the Agreement between the Government of Kaliningrad region and the "Foundation for Assistance to Small Innovative Enterprises in the scientific field". The cooperation with this fund enables the implementation of such regional programs as "Start" and "U.M.N.I.K." from federal funding.

The "U.M.N.I.K." program aims to identify young scientists seeking for self-fulfillment through innovation, and encouraging mass participation of young people in science, technology and innovation through organizational and financial support for innovative projects. The Fund enters the contracts with the winners of the program on a competitive basis, providing 200 thousand rubles a year for projects aimed at conducting a research in a particular area of research and development.

Small innovative company that performs a government contract under the "U.M.N.I.K." program receives funding from the Fund in the amount of not more than 10% of the annual funding of the winner of the program.

The "START" program is designed to help the novators seeking to develop and master the production of new goods, products, technologies or services using the results of their scientific and technological research, at the initial stage of development and with a great potential for commercialization. The interaction is based on a public-private partnership in which the state budget provides financial support to

reduce the investment risk of the private investor, and as business develops the state reduces the amount of funding in the hope that the company will attract extra-budgetary sources of funding either invest out of own sources if sales have started.

There are also occasional practices of providing material support by the government; as an example mentioned the provision of premises for industrial park of IKBFU.

At the same time the university community notes that there are virtually no instruments of financial support of R&D from the regional budget, and the regional government could be more active in that sense. The examples of such activity could be the organization of the fund of large enterprises that would fund the development of social infrastructure for the university staff.

Several years ago, there was also the practice of the research commissioned by the regional government when the government would order on a competitive basis to the universities to develop methodological guidelines, development programs of different sectors of the socio-economic life of the region. Among the representatives of the government and of the university community gradually matures the opinion that this practice must be restored.

The third group of sustainable practices of the university and government collaboration is realized on the university grounds with the participation of the representatives of the regional government:

1. Retraining of public servants.
2. The Supervisory Board of the IKBFU, which is chaired by the Governor of Kaliningrad region.
3. Communication platform on the university grounds: organization of forums, workshops involving regional authorities, business leaders, representatives of public organizations; "Baltic Educational Forum" in which representatives of the leading Russian and foreign universities discuss the direction of the development of educational institutions, and potential alliance of universities in Russia and foreign Europe in meeting the challenges of internationalization of higher education in Europe.

Generally in the region, after a period of decreased cooperation activity of the regional authorities with the universities there is a marked trend towards the development of cooperation. So far, such practices are mostly characterized by attracting the universities as an expert advisory body to participate in the development or evaluation of concepts and programs for the development of various sectors of Kaliningrad region. However, in the next year the realization of the long-term regional development strategy will require serious work in the field of modeling and forecasting of the social and economic processes, and such activities can be a major stimulus to the development of cooperation between the government and universities of the region. It is expected that implementation of the major investment projects on the basis of the newly established "Corporation of development of Kaliningrad Region," which will also create positive conditions for the development of communication and business practices of interaction between the regional government and the higher education.

Collaboration of the university and the regional enterprises.

1. **The development of innovative products.** Even though these practices are not yet as widespread, as we would like them to be, they do exist. Implementation of R&D at universities involving enterprises is carried out in several ways:

a) Direct orders for the development of scientific and technical products: software development

In KSTU was an interesting development of professor Ronzhenova. They have developed a particular system, where they have developed a formula and made software for planning of harvest.

– **The director of a small IT-company**

b) Perform R&D in certain areas by graduate and postgraduate students;

Our partners in the IKBFU – the Faculty of Engineering, the Department of Mathematics. Postgraduate students of our company study there; topics that we are working on, we try to form in their research thesis.

– **The director of a small IT-company**

c) Application of marketing innovations: the development of text and graphic advertisement materials;

We would like to develop marketing and advertising; there we could also collaborate in the field of innovations: a new approach to marketing and public relations, how to promote new products. Therefore we cooperate with the Department of Marketing and agreed that after one or two months of training will announce a competition for a brochure development. Students will develop materials, and the winner will receive material encouragement and possibly invitation to their full-time.

– **The head of a large industrial plant**

d) Competition and support of innovative projects of graduate and postgraduate students (in the form of grants with a fixed amount, or flexible financing depending on the project);

e) Establishment of joint ventures between business and the university. Yet few, but successful examples exist. The most attractive, in all likelihood, are the developments, which are, on the one hand, unique for the Russian and European market, and on the other hand, the most interesting for the domestic regional market.

Such developments may result from research and development, potentially useful in the key sectors of Kaliningrad region: manufacturing (food processing, furniture, automotive, shipbuilding and ship-repair). The following is a successful example of such a development:

If possible, we should use the potential of the university, based on the potential of our team, which was formed at the Department of Food and refrigerators. One direction

– *is a technology for the production of natural food supplements from fish bones. A second area concerns the development of a mechatronic class type of machines for the manufacturing industry. Our department has created some initial base in this direction, as in Russia, such works are not carried out. Mechatronic equipment, the mechanics and electronics – a new class of equipment that enables a fundamentally different approach to the creation of equipment that has intelligence. Up to date we have received up to one million rubles from the Russian Foundation (RFKM) in both research directions; the*

implementation of the first phase has begun, regarding the first and the second direction of work. The university supports, it provides internal grants to maintain this work. We apply for international grants; and or Polish colleagues are very interested in both of these directions with whom we have agreements on cooperation, exchange of information; We cooperate already.

– **Head of Department, University**

2. Educational and scientific activity.

- a) Training of company personnel at universities;
- b) Direct participation of managers and specialists of the companies in the educational process of the university: lectures, participation in practical and laboratory classes;

It would be useful to teach people where they learn. A few times I even went and lectured at universities. A general feeling that we have not yet reached mutual understanding: neither with universities nor with students. Maybe somehow coordinate requirements on other things, by whom to teach. But I understand that universities get the educational program top-down from the government so the format of our cooperation is not yet visible. Of course, we would like to cooperate with the university.

– **The director of a small IT-company**

We have cooperated quite successfully with the IKBFU, our staff read lectures on modern programming technologies, with the possibility of obtaining Microsoft certification after the seven-month course. It was successful.

– **The director of a small IT-company**

We are always ready to talk about the "how and what" is a Russian game business with great pleasure. But we have no interaction format. Is it possible, for example, to call someone a week ahead and say that I will have an interesting man, let's do a lecture? Will it be interesting to someone, will the audience gather? But in general, it is very good to share knowledge.

– **The director of a small IT-company**

- c) Organization of work practice and internships of students at the regional enterprises. Development of cooperation in this area is actively discussed and is supported on the both sides, but current practices are inadequate and need to be intensified. Potentially, it is this area that is the most promising in terms of bridging the gap between excessive "theoretic" training of students and the practical needs of the regional employers. However, to date this type of work often depends entirely on the initiative of the teachers or students. In the first case, when this activity stops on behalf of the teacher, this cooperation usually ends. In the second case, students perform self-employment during the period of training, and the acquired skills are inconsistent with the received education in any way.

All sensible guys of the 2–3 years of university courses are already working. Therefore, who will hang out and conduct some research activities? I do not think it is real, unfortunately. In Kaliningrad IT-companies have no research and academic issues, i.e. we cannot give any scientific problem, since they are all applied.

– **The director of a small IT-company**

We recruit a lot of students of their 4th and 5th year. Students come to us that have not completed education; we talk to them and take on the job. Very

often, you take not knowledge, but motivation, the willingness, the desire to stand out

– The director of a small IT-company

The enterprise mainly needs food processing technologists, we need engineers. We cooperate in this direction, and a lot of young staff come to work with us, but the level of practical training is fairly low, so to speak. So I think we can expand our cooperation, namely in the scope of practice.

– Director of a large food processing company

In the development of not just contacts, but sustainable practices of interaction between the universities and enterprises in the region, according to the regional community, could be more actively involved the government of the region. But it is recognized that it is impossible to "take and marry" universities and large industrial enterprises. The role of the government, according to the regional community, is rather creation of an institutional framework to encourage the emergence of innovative small businesses and expansion of the use of innovations in large and medium-sized enterprises in the region, while the increasing need in R&D will inevitably lead to the development of the partnerships with the regional universities.

The most active efforts, in the near future should probably be concentrated in the direction of the formation of stable organizational forms of cooperation between the universities and business in research and educational activities, the choice of the most appropriate forms and their subsequent institutional support.

To date, the cooperation is irregular, organizational forms are chosen ad hoc, that reduces the probability of choosing the most effective practices, increases the cost of the organization of the cooperation, reduces the chances for the implementation of the joint project. Important role in the emergence and implementation of any project is the factor of the personality of project initiators, which have a rather limited range of opportunities for institutional support.

The Entities of the innovative activity in the region consider it necessary to create conventional development programs of innovation areas in the region. There is a need to identify a set of priorities and clear rules of collaboration and mechanisms of support and stimulation of the aspiration of the innovative entities in this regard. The development of such a program and of the organizational mechanisms for its implementation would allow a clear division of actors' duties in relation to innovations in the regional community, and reduce unnecessarily expenditures on production of the situational regulators of the interactions, as well as enhance effectiveness of cooperation.

The University has scientific developments, a source of knowledge, experience, and the company itself reduces costs. The idea, while the university has no solution is not yet an innovation. University has to come up with new solutions, and some firms that innovate, should test and implement them.

– The director of a small IT-company

The region also needs to promote the existing positive experience of development and implementation of innovative products, including overcoming the inertia of thinking among the potential entities of the innovation activity. However, a simple creation of information sites is not enough, the direct communication with the authors of successful innovations is required, as well as between developers and potential customers.

Involvement of graduate and postgraduate students in R&D.

The involvement of graduate and postgraduate students in the research work is mainly done through their inclusion in the contract or teams that perform research and development within the state research contracts, grants of Russian and foreign funds, economic contracts. Today it is the main mechanism to attract graduate and postgraduate students to participate in research that can provide them some funding, to attach to the current university research and developments.

On the other hand, this practice has a number of drawbacks: for example, in such projects the graduate and postgraduate students have virtually no possibility to choose the topic of their scientific interest, research directions, initiative in the application of research techniques, etc. This problem could be partially solved by the assigning students to a particular subdivision of the university during the period of the course and qualification works, where students could independently determine the topics and areas of their research work within a framework that can be implemented in these units.

To date, there is no organized system of selection and attraction of students to research. In fact, the choice of a student to collaborate is carried out on a personal basis by the head and members of the research project group, using the experience of personal acquaintance, from teaching. This practice of "individual selection" certainly narrows the horizon of potential research participants from graduate and postgraduate students. This problem could be solved by creating a single database of research interests of the students.

2.2. Successful projects of the innovative development of the region: case-study

The regional community of Kaliningrad region offers a number of indicators to quantify not only the economic success of R&D carried out by the universities, but also the social effect that the research activities of the university has on the region:

1. Participation of university projects in federal grant programs to finance innovative research ("Eureka" award, programs "UMNIK" and "Start").
2. The number of small innovative enterprises initiated by universities, their turnover and profits.
3. Introduction of university innovations in enterprises of the region.
4. The amount of funding of R&D at the university and share of commercialized R&D.
5. The number of employed in innovative enterprises, created with the participation of universities, and the number of jobs created in enterprises in the region to implement innovative projects with the participation of the university.
6. Average salary of small innovative enterprises, created with the participation of universities (which allows to estimate the "fiscal impact" of R&D for the region).
7. The gross domestic product produced created by small innovative enterprises with the participation of universities.

We can see that the regional community has a fairly clear idea of what indicators can be used to assess the effectiveness of the innovation potential of the region. However, the greatest interest to us are the implemented projects on the development, creation and commercialization of innovative products, with the main entities of innovative activity in the region.

Case 1: Medicine and biotechnology.

One of the best known cases of successful R&D is the development of a wound healing bandage using the silver plated material at the IKBFU. The author of the design was a postgraduate student E. Bogdanov, who presented the bandage material with silver-coated nanostructure and the technology of its production at the competition of innovation developments "Eureka". The expert committee, consisting of the representatives of the Government of Kaliningrad region, Kaliningrad Regional Duma deputies, specialists in the fields of activity, civil society organizations, academia and high-tech companies in the region, has awarded the design the prize in the amount of 500 thousand rubles. The work was performed at the university at the Center for collective use "Innovation Park".

As noted by the regional experts, this development has almost no analogues in Russia and the only similar project was implemented in Bashkortostan. It is expected that the development will be useful not only in the regional market, but also on the federal level. An additional prospect to this project is due to the fact that this development clearly falls under the category of socially important goods, and the regional government is interested in its promotion. Furthermore, the development has great potential of commercialization due to the large demand in the eyes of the health agencies and security forces. In this case, the instruments of the state administrative regulation may serve to increase the financial base of the university's R&D in the field of medicine.

Case 2: Agro industrial machinery Information Technology.

Another case of the successful commercialization of R&D can be applied to the development of E.S. Ronzhin, Doctor of Science in biology, Head of the Agronomy Department at KSTU. Her work "The development and testing of innovative technologies of cultivation of major crops in the soil and climatic conditions of Kaliningrad region" (co-authors N.S. Dokuchaev, I.I. Brysozovskim, L.M. Grigovich) («Разработка и апробация инновационных технологий возделывания важнейших сельскохозяйственных культур в почвенно-климатических условиях Калининградской области» (совместно с Н.С. Докучаевым, И.И. Брысовским, Л.М. Григорович)) also awarded with the "Eureka" in the field of science, technology and innovation. The essence of the project is to develop a system based on the program formula of harvest planning, which allows to predict, model, and manages agricultural processes.

Note that in the framework of the department, headed by E. Ronzhin, regular training of specialists in the field of agricultural machinery is held, as well as the contractual applied research is conducted, creating a financial foundation for scientific research.

Case 3: Innovations at engineering production.

An interesting case, when the request for innovation comes directly from a private sector, is one of the largest industrial companies in the region "Baltkran."

The company realizes an important function of promoting scientific and technological development, as well as employment training, in-demand of the regional economy. In addition to engagement of professionals trained by the regional universities (not only in technology, but also physics, economics, documentation, marketing), the company initiated the creation of a new specialization of studies at the KSTU- "engineering", and now plans to become one of the major employer of this

specialty. The enterprise has a system of university students' internships with subsequent employment of the most talented students. In addition to the awareness of the importance of its social function to the region, the company sees an opportunity in this practice to reduce the costs of attracting skilled workers: time and financial costs of adaptation of the attracted experts from other regions, the cost of hiring and housing, etc.

OJSC "Baltkran" also acts as a customer of scientific and technical products from the universities: in particular, in the field of energy and energy-saving technologies (e.g. a project to reduce energy consumption through the development of search and adaptation in the power block).

In addition to the technical developments, the company acts as the customer of research and development in the field of marketing and advertising: the creation of promotional products, advertising copywriting, surveys of the target market share, developing visual promotional materials, provide training for their employee in the field of business communication, effective management negotiations. These types of work are performed by the market in the departments, as well as philology and journalism departments of the IKBFU.

Case 4: University innovation enterprises.

A successful example of the development and commercialization of innovative products at the initiative of the university are the two projects of the KSTU. The result of the university R&D became two small innovative enterprises.

The first one is based on the technology of natural food supplements from fish bones, obtained from secondary waste processing of raw fish. Usually this product in the food and fish processing companies is recycled or exported for animal feed. The university development implies the use mineral substance present in the existing waste to create a natural food supplement that can be added to dry products. Similar products are already available in the UK and the U.S., so its potential for entering the international markets is limited, but on the local and Russian markets, it is in demand.

The second enterprise is built on the basis of Mechatronics: development of a machinery type based on the principles of mechanics and electronics. These technologies have no analogues in Russia, is the development of the university scientists, which, again, gives them a good potential for commercialization in the broad domestic market. The value of the equipment that is produced by using this technology is in use of potential of the artificial intelligence systems for mechanical equipment (through the use of microprocessor-based equipment, the creation of specialized software).

The development of these is about two million rubles attracted from the Russian funds, but the start was given by the internal university grants. At the moment, there is a search for opportunities of international finance, especially by Polish investors.

Case 5: Technopolis and the three-dimensional interaction.

One of the potential centers of innovative collaboration between business and universities can become a project "Technopolis Gusev." This project is an innovative cluster in the city of Gusev, Kaliningrad region, located in the territory of 230 hectares and combines production zones, a research center and a residential area. The final implementation of the project is scheduled for 2016, but already in the

technopolis are functioning the fabrication plant of electronic household products "Digital Television Systems", the factory for production of antennas and hulls "Prankor", the Center for Research and production of microelectronics "DzhiEs-Nanotech", production plant for corrugated cardboard and Packaging «First cardboard factory "house-building factory "Beliy Kliuch". The implementation of the project will have a significant effect on the socio-economic development of the area and its scientific and technological potential.

IKBFU signed an agreement on scientific and the technological cooperation with Technopolis' general investor- the company «General Satellite». At the initiation of this contract the regional government has played a significant role. It also took part in the achievement of an agreement on cooperation between the university and the Baltic nuclear power plant, when the university completed the work on seismic research, the development and installation of the sensors to measure vibrations of the crust. The mediation activities of the government are also required in the relation to the inter-regional and international agreements on the potential use of the university's super computer for the needs of large commercial companies, both in Russia and abroad.

§3. The potential of the universities in the innovative development of Kaliningrad region

3.1. University resources

To date, the regional universities have accumulated resources for the implementation of the programs of innovative development of the area. The greatest potential, according to the local community, has the IKBFU, undeniable advantages are the significant financial flows of the federal subsidies, as well as device-technological base.

The availability of the powerful economic resources allows the university to increase its scientific and technological capabilities in the future, including in attracting highly qualified scientists, lecturers and administrative staff, as well as advanced training of existing staff and the quality of students training.

The situation is, certainly, complicated by the fact that universities have very limited possibilities of financial incentives to attract and retain young employees, at least, direct, and in particular -at the stage of idea development, while the stage of commercialization is still far, and the necessary work requires financial support. The solution may be the establishment of annual scholarships and grants to be allocated on a competitive basis.

These three components –the trained staff of the high competence, the advanced instrumentation and technical base, the economic resources – give the opportunity to the university to become a full innovation leader, performing not only research and development but also producing expert appraisal and consulting work.

At the same time, despite the opportunities of material and technical assets, the preparation of highly qualified personnel cannot be done just as quickly, and most importantly – the quality of personnel cannot be a linear function of the financial and technical capabilities of the university. This process requires some institutional changes, structural changes, fine-grained control, so even the representatives of

universities are doubtful to what extent will it be solved in the next few years, to what extent the problem of human resources will be solved for the innovation economy. In particular, the necessity of bringing research teams (perhaps consisting in varying degrees, from graduate and postgraduate students), with interesting developments and projects from outside is discussed.

The words of the deputy minister of the regional government best illustrates the situation:

Infrastructure is ready. Technoparks are formed, young professionals come to research. However, the academic preparation of innovative thinking people is far from perfect. The students do not consider their education as professional training, and in demand on the regional labor market.

– Deputy Minister, regional Government

In other words, if the infrastructure of universities is ready for execution of the leaders' role of innovations, the substantive and organizational aspects of the changes necessary for the formation of an innovative environment takes time and competent management. However, the entities of the innovation activity recognize that the level of management in the universities is high enough to ensure the management of these transition processes.

In addition, the universities in the region have a great human potential, an open access to modern information technology, including the library's database of the world universities, opportunities of international mobility, attracting the world's scientists for university staff training. Existing competencies, skills and technical capacity, allow universities to conduct research of various properties of objects, validation and test methods, develop implementation programs of R&D results, etc.

Among the **strengths** of the regional universities experts include:

- geographic location (proximity to Europe, including – to the European Innovation Centers);
- Availability of developed international links for the exchange of experience and scientific cooperation;
- The availability of the federal status at the leading university in the region;
- Substantial funding and available equipment for research and educational purposes;
- Opportunities for the development of human resources potential;
- Highly expressed scientific and educational specialization of universities, making it possible to develop their regional niche in innovative research and development.

As **weaknesses** noted:

- Low salaries of lecturers (reducing the motivation and ability to work on R&D and attract students);
- Departure of strong applicants and students abroad for higher education or postgraduate training (which is a function of two factors: the already mentioned positive ones – the proximity of Europe, and the negative – low wages, especially of young professionals);
- Extensively used potential of human resources (lack of involvement of leading scientists, the lack of popular master's programs);
- Low level of commercialization of scientific research (and weak market demand);

- Poorly developed institutions and forms of interaction between universities and business (business incubators);
- Difficult competition with Russia's leading innovation centers for receiving financial support;
- Lack of institutional forms of motivation and involvement of students in innovative research and development and promotion the commercialization of own R&D;
- Low level of practical training of students.

3.2. The impact of the universities on the formation of growth points

In general, the impact so far is estimated to be insignificant. Despite some successful experience in support and implementation of innovative student projects, it is still very early to talk about an institutionalization of commercialization of the research and development. First, the intellectual potential of the students is rather poorly aligned with the needs of the regional community, and therefore little demand by private enterprises and non-profit organizations. Second, the mechanisms that bring promising ideas to the stage of commercial product are not well established and formalized.

A great potential impact of the universities on the innovative development of the area can be seen in the training of the personnel, which would be involved in the regional innovation economy. However, the interaction between the universities and the private sector is also at the stage of development, and the existing best practices in the participation of enterprises in training are often irregular and largely depend on the factor of personal relationships.

The University is able to give a mobile respond to the needs of the region, to modify the curriculum, to offer new specialties, establish cooperation with universities in the Bologna system for the provision of the required courses. Businesses has not been interested in cooperation with higher education and the development of new technologies, and small businesses, created on the basis of universities, still needs to grow.

– Deputy Minister, regional Government

Existing barriers can be overcome, provided more openness of the universities to the regional community, facilitation and development of inter-organizational horizontal communications, development of joint projects with business, and the use of intellectual and equipment base of the university and the market expertise and financial resources of the business.

It is expected that the possibility of a two-tier system of training students will also allow the development of new forms of cooperation of universities and the regional community. In particular, it is necessary to use the opportunity to jointly develop and regular adjustment of the educational programs of undergraduate and master's degrees, the introduction of new teaching methods, more oriented to the needs of the region, working together in training of the students, starting with the 2-3 year of bachelors. This will not only introduce new elements in the content of the educational process, to include the specific regional and sectoral components in the structure of the acquired knowledge, increase the value of graduate professional at the regional labor market, but also to give to students a better understanding of the

possible application of their knowledge and skills, to give innovative ideas an applied direction.

The existing problem of physical space to create an innovative platform of the interaction between the universities and enterprise will be resolved within two years, when on the basis of the IKBFU a physical space will be prepared for creation of a technology park and a business incubator.

In addition, universities have an important impact on prestige, "working" on the image of the innovative region (creation of a federal university, in particular, had a very strong influence), but without the appropriate factual evidence of innovation developments, reinforcing this image, the prestige may soon "fade."

3.3. The innovative specialization of the universities

To date, among the leading universities in the region, according to the regional community, a certain specialization in scientific and educational activities has developed.

Thus, **the Immanuel Kant Baltic Federal University**, according to the popular belief, is a center of basic science. It has a strong laboratory and instrument base, strong personnel structure in the field of physics and mathematics, as classical university it covers the entire range of specialties, and therefore perceive as a training center for the social and humanitarian, economic sectors of employment.

By the same features of the IKBFU recognizes the right to participate in the development of a regional development strategy, including through training for the priority sectors of the regional economy (e.g., tourism).

As the most developed areas in which the IKBFU has the advantage, experts mention the following:

- a) Physics (including the study of nanomaterials, their physical and chemical properties, thermophysics);
- b) Applied mathematics (including mathematical modeling);
- c) Computer science and information technology;
- d) Chemistry;
- d) Medicine and biomedical technology;
- e) Psychology;
- g) Energy-saving technologies;

Research and training in **Kaliningrad State Technical University (KSTU)** has, in the opinion of the regional community, more applied format. The main branches of professional training, areas of research and industry of small innovative enterprises created with KSTU, are related to key sectors of the regional industry.

This provides the Technical University with additional benefits in finding customers for its research and development activities. The university has historically tight relationship ties with many large industrial enterprises in science and technology partnerships, facilitating not only the joint research work, but also training, in demand by the regional economy. On the other hand, KSTU does not have such a strong financial and material-technical base, as IKBFU, which severely limits its ability to develop their own innovative capacity, and traditional heavy industry (shipbuilding, engineering, fishing industry) since the collapse of the Soviet Union going through a serious crisis. Despite this, the individual units of the KSTU

retain successful collaboration with companies in the region (e.g., Department of production process automation works with "Lukoil Kaliningradmorneft").

Today in the KSTU, according to the regional community, the most developed of research and training the following:

- a) Construction;
- b) Shipbuilding;
- c) Machinery;
- d) Fishing industry (including fishing, fish processing);
- e) The food processing industry;
- e) Agriculture and agricultural technology;
- f) Biotechnology;
- h) Information technology.

The range of possible directions of innovative development of the **Baltic Fishing Fleet State Academy** (BGARF) is limited even more, because of the narrow original orientation of the university to ensure the fishing industry with technology and human resources. With the traditional to the region fishing industry are related the major activities of the university, and its current position, as evaluated by the regional community, is less favorable in terms of economic, research and human resources potential.

However, university, according to the regional community, conducts applied research, with the largest potential in the following areas:

- a) Aquaculture;
- b) Navigation;
- c) Shipping;
- d) Fishing.

The level of competition in the field of innovations according to the experts' estimates is very low, almost zero. According to them, the competition at this stage can be conducted solely for sources of funding, mainly governmental. Strongly pronounced specialization of universities, the difference in the innovative capacity and resources for its development, low innovation activity of the researchers, the lack of open spaces for investment and innovation projects offers cannot generate a market with a high density of competition. In the medium term we can hardly expect a high level of competition in the market among the universities in the region.

3.4. Prospects for the development of innovation activity of the IKBFU in the region

An issued decree by the President of Russia on the formation of the Baltic Federal University automatically conferred upon the university a duty of wide influence on the innovative development of the territory. It is in the role of principal agent of innovation -in the broadest sense –the regional community perceives the university and its development programs an integral part of a broader strategy for the region.

Today the university actively implements research in three priority areas: physics and nanotechnology, information technology, biotechnology and medicine. In all three areas, the active work is in progress, there is an experience of commercialization of the research results. However, the regional community is not quite

ready to finance R&D and implementation of research products, partly because of economic disinterest.

However, it would be wrong to say that the regional community, including the business community is not interested in the development of innovative products. The representatives of the government, business, scientific and educational institutions of note that the most attractive opportunities in the regional development are associated with the following directions:

1. machine tool industry;
2. information and communication technology;
5. nanotechnology and materials science;
6. tourism, recreation and rehabilitation;
7. chemistry;
8. thermal systems and energy;
9. microelectronics.

We don't have a developed economy in the region; and we are faced with the fact that on the one hand we have to prepare masters as a leading university, postgraduate students of a high level of training, but an undeveloped economy does not need specialists with high education; vocational school students who can hold a screwdriver in the hand are enough. On the other hand – we went to something higher, you have to move and then it turns fork branching. The university must develop areas related to application activities, such as services and tourism, to train engineers. Here the university serves as the flagship in the development of the region, and it is hard, but there is the concept of "extracting demand" and the university will help the region to "pull" in the leading position.

– Deputy head of the university unit

The regional business community understands that the developed products must be directed not only to the regional market, but also to the Russian and European markets. Such directions would help to overcome the limitations of the unwillingness of the regional economy to a massive investment in R&D and restructuring of its operations with a focus on the production of products with high added value.

What are the important trends of the regional development the regional community associates with the IKBFU?

First of all, it is technology and developments in the region related to the development of the natural resources potential of the region: of technologies, which are related to the subsurface of Kaliningrad region- geology, chemistry, and biochemistry. The last field is especially true since, as the business community notes, many of the products of primary processing of natural resources (e.g., farms) could go to another production cycle (currently they are either disposed or exported). Compared to the other leading universities of the region that are more focused on agriculture and mining, the IKBFU has less experience in this field, but it is already quite capable of solving applied problems in the collaboration with local companies.

The second area involves the development of materials, physics of nanostructures. The interest in such developments is present not only in the university environment, but also in the industry. The university has long been conducting the re-

search in this area, there are developments, including ones brought to the commercialization phase. The presence of such developments can provide a competitive advantage for the industrial enterprises of the investor, and is potentially one of the most attractive areas of applied research.

The third area— life science, medicine, and biotechnology. In light of the development of the tourism industry, which the regional authorities noted as one of the strategic priorities, it is very relevant to see the development of the university research in the field of medicine and biotechnology. At present, the IKBFU is actively developing both these areas: the equipment is purchased, the specialists are being trained, there are relevant research units established, scientists from the leading universities in Russia are being invited. The further research in this area does not only have a positive effect on the quality of the life in the region, but also can serve as a basis for the development of the medical tourism.

The fourth area- information technology. Kaliningrad region has a well developed set of software developers, including games. The representatives of IT companies mark the mobile devices content development as a potentially attractive to the market, as well as development of software to optimize the organizational, technical and business processes at the enterprise. This direction, does not require significant transport and customs costs, is not limited to the regional markets, and therefore can be considered as one of the most innovative and adaptive, including the conditions for entry into the WTO and the termination of operation of the Special Economic Zone.

The leading role of the IKBFU in a regional scope in general socio-economic processes in particular implies the development of training in the field of education, which will be responsible for the reproduction of both innovative knowledge and approaches to their generation.

The main conclusions and recommendations.

Summarizing the results, we can conclude that, in general, to create a favorable environment for the development of innovative potential of the area, the following steps must be taken:

1. To determine the purpose of sustainable socio-economic development of the region, to identify priority sectors, to form a support program.
2. To put in place institutional framework regulators of the innovative activity of economic entities: grants and tax incentives for businesses that are funding and involved in R&D, which will provide economic incentive to engage in innovations' development.
3. With the participation of administration, business and university, the organizational forms for the formation of institutions of communication and cooperation in the field of innovation (business incubators, technology parks, data centers) should be developed and established.
4. To ensure the dissemination and implementation of best practices in the field of co-innovation activity of universities, businesses and government.

Among the practical measures to promote innovative development of the region and to reach the substantive conditions, in our view, the following processes should be done:

1. Stimulation of the growth of high-tech industries in the region, the state policy should be aimed at increasing their investment attractiveness, on support of

Russian manufacturers of high-tech products and services, on promotion of these products to the regional, domestic and international markets, on the development of intellectual potential in the field of high technologies;

2. The development of scientific activities of universities, tighter integration of scientific and research units and the educational process at universities, increasing the participation of regional companies in research and development activity of universities;

3. The development of international scientific and educational cooperation between Russian and foreign universities, including the universities of Northern Europe;

4. With the increasing growth rate of the sector of research and development – the organizational forms that act as a bridge between private and public actors should be created (private independent consulting company, that develop and market applications knowledge, and technological services to private companies and public authorities), and accredited by the state.

It must be remembered that much of the current activity in the business sector of both the European and Russian markets is related to the natural specialization of the traditional industries, which are both major employers, and the developers of these sectors, among the main priorities of which are not necessarily the innovative development. For example, wood, pulp and paper, mining and metal, as well as food processing industries.

These sectors should be taken into account in the development of the innovative policies and while assigning the priorities of investment placement in innovation infrastructure, because the innovative development of these sectors can have a huge impact on the formation and development of the high-tech market. The transporting industry (especially maritime transport), the financial and business services also deserve additional attention.

Kaliningrad region has some experience of the innovation developments in these industries, and the technology and experience of innovations should be borrowed from the Nordic countries- leaders in the development of innovative products for the energy industries, automotive and mechanical engineering industry, electrical equipment and other light industries. In addition, the Baltic Sea countries are actively involved in innovative developments in information and communication technology and biotechnology, while the region should promote international cooperation in these potentially attractive industries for the region.

To enhance the interest of large business in innovative developments the institutional costs of the resource-based economy should be overcome, as even the massive infusion of the public funds in R&D cannot qualitatively change the situation in the absence of real incentives for businesses to acquire and implement technological and organizational innovations. The use of new forms of scientific and technical cooperation in the framework of national innovation system, including the involvement of foreign agents (companies, universities), could have a qualitative impact on this situation.

However, although the region can increase productivity by adapting the existing technologies or implementing additional improvements in those sectors that have reached the innovation stage of development, it is not enough to preserve or- especially -to enhance competitiveness. The substantial investment in R&D, the

availability of research institutions, cooperation between universities and industry, and effective protection of intellectual property is required.

For the transformation of the institutional environment of innovation development it is necessary to ensure the following controls:

- A set of regulatory controls of various aspects of innovation activity;
- Financial support of innovations at every stage of the life cycle, particularly during start-up;
- State privileges and tax benefits for venture capital projects and programs, public contracts and procurement on a competitive basis of the most promising products;
- Information support of the innovation activity, management of the innovative projects and developers database;
- Training on various aspects of innovation activity and technological management;
- The formation of the expert community, providing a variety of services in the field of technology and management;
- Creation of an innovation culture in the society.

In addition to economic and institutional change, it is necessary to adopt a series of technical and infrastructural measures stimulating the achievement of a number of basic conditions:

- renovation of fixed assets and the replacement of obsolete equipment in full;
- Increase in the proportion of industry organizations that use innovative technologies;
- Increase the overall cost of technological innovation, particularly in product innovation.

As for the key technologies that are necessary to pay attention to, and that can be linked to the greatest successes of the innovative development of Kaliningrad region in the medium and long term, we can state the following:

1. Technologies of the food processing industry (developments, providing technical re-equipment and the introduction of innovative products and entering new markets).

2. Technologies of the wood industry (products that will insure technological modernization of equipment and the use of new technologies – deep wood processing, efficiency and environmental friendliness of pulp and paper production, introduction of new technologies in housing construction, and corresponding software development and information technology in the field of wooden housing, efficient production of wood finishing materials, new methods of processing waste lumber).

3. Technologies of electric appliances, in particular the production of electronic data processing systems and equipment for the telecommunications, power equipment, medical equipment.

4. Mechanical engineering technologies that involve prospects for instrumentation sector (especially optical systems and devices) and the development of new technologies for processing of metals (especially nanotechnology).

5. In information technology, the most promising area is the development of specific software.

In our view, the implementation of these measures will achieve a reduction of strategic uncertainty about the prospects for development of the region, form the

investment attractiveness of innovation at the institutional level, ensure the development of mechanisms for the cooperation in R&D and the reduce of communication, organizational, time and financial costs and risks, improve the skills of graduates and demand on them from on behalf of the regional economy, and ultimately-ensure the growth of the economic and social benefits from the innovation activity in the region.