Regional Innovation Strategy for the Lodzkie Region

LORIS 2030

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THE DEVELOPMENT WAS PERFORMED IN COOPERATION WITH:

Deloitte Business Consulting S.A.

Lodz Regional Development Agency S.A.

WITH THE COOPERATION OF THE EXPERT TEAM:

Prof. Piotr Kula, Pro-rector for Innovation, Lodz University of Technology (substantive consultations)

Prof. Edward Stawasz, University of Lodz

Aleksander Buczacki, PhD., Warsaw University of Technology

Paweł Głodek, PhD., University of Lodz

Monika Piotrowska, Expert for monitoring and evaluation

The work on the development of RIS LORIS 2030 was also attended by members of the RIS Steering Committee and members of the expert panels.

MEMBERS OF THE RIS STEERING COMMITTEE

prof. Jan Gajda	Dean of the Faculty of Economics and Sociology, University of Lodz
prof. Ewa Walińska	Dean of the Faculty of Management, University of Lodz
prof. Andrzej Pomykalski	Faculty of Organization and Management, Lodz University of Technology
mgr Aleksandra Sowińska – Banaszkiewicz	Chancellor, Strzeminski Academy of Fine Arts Lodz
Mikołaj Gurdała	Director, Analysis and Strategy Agency, Medical University of Lodz
Tomasz Sadzyński	President, Lodz Special Economic Zone Joint Stock Company
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phD Mirosław Urbaniak	PhD, Prof., Lodz University of Technology, President, Council of the Federation of Scientific and Engineering Associations - NOT
Jacky Lacombe	President, Dalkia Lodz Joint Stock Company
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Tadeusz Dardas	Vice-President, Philips Lighting Poland Joint Stock Company
Paweł Łuczka	President, Ceramics Paradyż LLC
phD Paweł Głodek	PhD, Faculty of Management, University of Lodz

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The project was realized by the Department for Entrepreneurship of Marshal's Office of the Lodzkie Region, composed of:

Jacek Skwierczyński
Łukasz Siekiera
Agata Sarzała
Beata Michalska-Dominiak
Kinga Gołębiewska

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List of abbreviations

BDL	Regional data bank
BIZ	Foreign direct investment
CASI	Computer assisted self-interviewing
CAPI	Computer assisted personal interviewing
CATI	Computer assisted telephone interview
CAWI	Computer assisted web interview
CTT	Centre for technology transfer
EE	Energy efficiency
EFRR	The European Regional Development Fund
EFRROW	European Agricultural Fund for Rural Development
EFMR	European Maritime and Fisheries Fund
EFS	European Social Fund
FGI	Focus group interview
GUS	Central Statistical Office
PE/VC	Private Equity / Venture Capital funds
IB	Research Institute (formerly: research and development entity)
ICT	Information and Communications Technology
IDI	In-depth interview
IOB	The institution of business environment
ŁARR S.A.	Lodz Regional Development Agency S.A.
ŁPTW	Lodz Knowledge Transfer Platform
SME	Small and medium-sized enterprises
OZE	Renewable energy sources
PAN	Polish Academy of Sciences
POIG	Innovative Economy Operational Programme
POIŚ	Operational Programme Infrastructure and Environment
POKL	Human Capital Operational Programme
RPO WŁ	Regional Operational Programme for the Lodzkie Region
RSI LORIS 2030	Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030”
R&D Sector / entity	Research and development sector / entity
SW	University
UM	Marshal’s Office

Introduction

For many years now, Innovation has been considered a prerequisite for the dynamic development of the economy. It has already been some time since EU policy makers set an objective - to make the European Union the most dynamic and competitive knowledge-based economy. Despite setbacks in the implementation of the then prepared Lisbon Strategy, the European Union remains committed to its main objective - the development of a knowledge-based economy, capable of sustainable development and socially cohesive. It is to be realised by combining the operation of transparent public institutions, efficient public expenditure management and promoting the development of technology and innovation. Today, the development of innovation is to be implemented on the basis of smart specialisation of regions. After a careful analysis of the macro-and microeconomic data, interviews and meetings with representatives of the regional community, areas of smart specialisation have been designated in the Lodzkie Region, thanks to which it has a chance to become one of the most innovative and competitive regions in the country.

The intention of the authors of RIS LORIS 2030 was to create a consistent, transparent and clear document of operational nature, i.e. focused primarily on preparing the catalogue of possible-to-implement initiatives in support of the strategic directions of development of the region. In accordance with the recommendations of the documents at the European level,[1] focus has been placed only on the most important issues for the region and priorities have been set. It should also be noted that one of the ideas for the development of the strategy was the correlation of the Strategy with the industrial and economic background of the region, as well as its business orientation.

The directions of development, advised in the RIS LORIS 2030, focus primarily on improving the socio-economic potential of the creation, diffusion and absorption of innovation. The proposed strategic directions of development of the region are part of a nationwide trend, and are in line with the national strategic documents, including the Long-term Development Strategy of the Country and the Strategy of Innovation and Economic Efficiency “Dynamic Poland 2020”. The quest for better use of the existing potential, including labour, knowledge and capital, as well as building new forms of competitive advantage by increasing spending on development activities, such as research and development, education, information society infrastructure, and methods for their effective use for economic purposes, is now the only reasonable solution.[2] The development of the Lodzkie Region will take place in a harmonised and sustainable way only if the entities belonging to the so-called „quadruple helix”[3] are fully involved in the implementation of the strategy. The key to success in building an innovative region is the use of synergies, cooperation and joint efforts to achieve the objectives.

The essence of the RIS LORIS 2030 are measures that support the development of entrepreneurship, strengthen the cooperation of enterprises (especially SME), research and development entities, institutions of business environment and administration, and promote the broadly defined innovation in all areas of economic activity. The second key element of the Strategy is the system of management, implementation, monitoring and evaluation of the RIS LORIS 2030, indicating the selected entities responsible for carrying out the tasks of the Strategy, showing how particular activities are coordinated, as well as setting out easily measurable, and understandable indicators for ex-post evaluation of the Strategy after the implementation process of RIS LORIS 2030 has been completed.

1 Guide to Research and Innovation Strategies for Smart Specialisation

2 Problematyka innowacji w Unii Europejskiej, Financing Polish Science, Chyłek E.K., Herba Polonica, 2006

3 The concept of the quadruple helix - formulates the need to conduct a policy in a system, in which public authorities, the sphere of science, and business and customers / users (the public) participate.

Summary

This strategy is the final result of the works carried out within the project *A study of the technological situation of the Lodzkie Region including the preparation of 5 thematic reports and the development of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030".* The main objective of RIS LORIS 2030 is an analysis of the innovative potential of the Lodzkie Region and identification of strategic directions of development of the region, and thus to lay a path that will allow to achieve, within a given time horizon, i.e., by 2030, a strong position of the Lodzkie Region in the creation of innovation and business development (especially in small and medium enterprises). An important aim of the document was to identify - in accordance with the recommendations of the European Commission - the regional specialisations (smart specialisation). Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030" has been prepared on the basis of the main conclusions and recommendations developed under the seven dedicated reports, i.e.

1. *Model of technology transfer in the lodzkie region including the existing regional entities to support business growth.*
2. *Regional Monitoring and Evaluation System.*
3. *RIS Development Scenarios up to 2030.*
4. *Preparation of a model for technology transfer in the lodzkie region.*
5. *A model for funding innovation including recommendations for the new programme period.*
6. *SWOT analysis of the region in terms of innovation and SWOT analysis of the key sector for the development of the lodzkie region.*
7. *Strategic goals, objectives and directions of development for the RIS LORIS 2030.*

The following presents the layout of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030", making it easy to move through the document and its key assumptions.

This strategy consists of the following parts:

1. *Diagnosis of the situation in the region in terms of innovation.*
2. *SWOT analysis.*
3. *Scenarios for the development in terms of innovation.*
4. *Presentation of the vision, mission.*
5. *Layout of the strategic and operational objectives.*
6. *Presentation of the action plan.*
7. *Characteristics of the system of implementation of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030".*
8. *Overview of the monitoring, evaluation and updating system of the Strategy, along with the timetable.*
9. *Presentation of the financial framework.*

The diagnosis of the situation in the Lodzkie Region in terms of innovation includes, among other things, the assessment of the economic and innovative potential of the region, the evaluation of the situation regarding the funding of innovation, the analysis of the scientific potential of the region, as well as assessment of the needs of innovative companies in the region. Based on the (Regional Innovation Scoreboard for 2012) prepared by the European Commission, it can be concluded that the Lodzkie Region is a poor innovator on a modest-medium level with a progressive growth dynamics of innovation.[4] In the European study of the regional innovation indicators, the Lodzkie Region has improved, compared to the years 2007 and 2009, the results for indicators such as the share of population with tertiary education,

4 Progressive growth dynamics of innovation is a classification drawn up based on studies of regional innovation conducted by prof. Assoc. Hanna Godlewska-Majkowska.

public R&D expenditures, business R&D expenditures, non-R&D innovation expenditures, sales of new-to-market and new-to-firm products. The rate of employment in knowledge-based activities, as well as the number of patent applications submitted to the PCT, has remained unchanged.[5] Weaker results have been reported in the voivodeship with respect to indicators such as: the percentage of SME innovators of all SMEs in the region, the proportion of SMEs cooperating in the past three years as part of any agreement to raise innovation among all SMEs in the region, the percentage of companies that have implemented innovation onto the market, in which they operate (among all SMEs in the region), and employment in sectors of high and medium technology.

The diagnosis of the region was the introduction to the identification of specialisations (industries) and technological areas key for the region. The process of selecting key regional specialisations (industries) consisted of three phases:

I. *Identification of existing industries in the Lodzkie Region.*
II. *Assessment of the potential of industries existing in the region.*
III. *Indication of the specialisations of the region (in this stage, the potential of the identified industries has been compared to the technological potential of the voivodeship).*

As a result of the assessment and public consultations, six regional specialisations have finally been selected:

- Modern textiles and fashion industry (including design);
- Advanced building materials;
- Medicine, pharmacy, cosmetics;
- Power engineering, including renewable energy sources;
- Innovative agriculture and food processing;
- IT and telecommunications.

However, in the selection of key technology areas for the Lodzkie Region, four main areas have been identified, which, because of existing potential in the region are likely to grow and support the growth of the Lodzkie Region. The technology areas include:

1. Biotechnology.
2. Nanotechnology and functional materials.
3. Communication and information technologies.
4. Mechatronics.

In **the second part** of the document, on the basis of, among other things, a diagnosis of the situation in the Lodzkie Region, a SWOT analysis has been carried out, which allows for a critical assessment of the socio-economic situation of the region with the inclusion of the following areas:

- Knowledge-based economy;
- Science in the service of innovative development;
- Knowledge-based society;
- Regional innovation policy;
- Knowledge-based administration.

In **the third part** of the document, three scenarios for the development of the Lodzkie Region up until the year 2030 have been presented:

5 PCT - It is an international procedure that allows obtaining patent protection in selected countries around the world, carried out under the Patent Cooperation Treaty (PCT).

1. Moderate (neutral) scenario.
2. Optimistic scenario.
3. Pessimistic scenario.

The baseline scenario is the moderate (neutral) scenario. It is based on the trends and strategic challenges set out in the Regional Development Strategy of the Lodzkie Region up to 2020. In addition, it includes the provisions of the Strategy of Innovation and Economic Efficiency for the years 2012-2020 „Dynamic Poland", the „Poland 2030" strategic document, and Long-term National Development Strategy. The two other scenarios are an extension of optimistic and pessimistic assumptions made in the moderate scenario.

For each option, the division of the following areas has been applied:

- Legal and institutional environment;
- Economy;
- Research and development;
- Innovative companies;
- Business environment institutions;
- Human capital;
- Society.

In **the fourth part**, the vision and mission for the RIS LORIS 2030 has been identified, as well as the principles that should guide the implementation of innovation policy in the region. The definitions of concepts: innovation, product innovation, process innovation, marketing innovation, organizational innovation and eco-innovation are also a key element of this part of the report. This will allow a clear understanding of the concepts identified by all participants of the Regional Innovation System, and facilitate their promotion.

The **fifth part** provides a detailed proposal for the strategic and operational objectives for RIS LORIS 2030. The operational objectives (in relation to each priority) and their justification and description and expected results, as well as measures leading to their implementation have been indicated in this part.

Priority 1. Regional specialisation is designed to build a competitive advantage based on the so-called driving forces of economic development, specific to the lodzkie region. The implementation of this Priority is to contribute to the development of key regional specialisations (industries), (using key technologies), that have been identified as having particular potential for innovation, and that have the potential to become a regional driving force of development. The implementation of this Priority will consist of 5 operational objectives, within which 15 measures have been specified.

Priority 2. Development of the innovation potential aims to use the internal potential of the region to improve the innovation of the economy of the lodzkie region. Support in this area will cover a wide range of innovations, including supporting product, process, organizational, marketing and eco-innovation at all levels of their impact, i.e. locally, regionally, nationally and internationally, and will be aimed at entities from all sectors, apart from areas of specialisation covered by Priority I. The support will also take into account the specifics of the functional areas defined in the region. The implementation of this Priority will consist of 5 operational objectives, within which 12 measures have been specified.

Priority 3. Managing the region's innovations aims to improve the innovation policy conducted in the lodzkie region and the formation of the regional innovation system. Support in this area will relate to the preparation of institutional and organizational structures, tools and instruments to support the implementation of initiatives under the other two priorities. In addition, the activities under this *Priority* will

be based on building awareness of the importance of innovation for the development of the region, as well as raising awareness in this field among all entities operating in the lodzkie region, especially those that should carry out activities in support of pro-innovation, i.e. local governments, socio-economic partners, the science sector and business environment institutions. The implementation of this Priority will consist of 5 operational objectives, within which 14 measures have been specified.

The layout of objectives and measures within the priorities described above, was built using a process approach, which assumes the need to take (within each priority) actions aimed at: building and developing awareness of innovation, the development of knowledge (in terms of innovation, regional specialisations, key technologies, etc.), development of communication and cooperation between the entities involved, and the financing of projects and initiatives for innovation, including high-risk projects. This approach has been developed as a result of the diagnosis of the situation and analysis of the barriers to the development of innovation in the lodzkie region.

In this part of the document, the connections between the objectives of RIS LORIS 2030 and other strategic documents at the regional, national and community level have also been identified. Both the strategic and operational objectives proposed in the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030" are fully consistent with the overarching documents.

In **the sixth part**, which is the most elaborate part of the document, proposals for specific operational measures aimed to achieve the specific objectives proposed for the implementation of RIS LORIS 2030 have been made. The description of each activity in the system has been prepared containing the justification and purpose of the measure, a description of the measure, the main tasks to be performed as part of the measure and the results planned to achieve.

The seventh part of the document deals with the proposed implementation system of the RIS LORIS 2030 in the Lodzkie Region. The overall objective pursued by the process of designing a new system of implementation of the Strategy is to identify institutions / bodies responsible for the implementation of their respective tasks, and thus organize a structure that will enable the effective management of innovation in the lodzkie region. In addition, in order to maximize the profits resulting from the implementation of RIS LORIS 2030 and minimize the costs incurred as a result of this process, the system design seeks to exploit the potential of already existing institutions and entities without the need to create new, expensive and often inefficient bodies. To achieve the objectives, best practices in the design of the implementation systems, both in other voivodeships as well as in other EU countries, served as an inspiration.

The key participants involved in the implementation of the system include: the Regional Government of the Lodzkie Region and the Marhal's Office in Lodz (Department for Entrepreneurship), and many other external institutions with a direct or indirect impact on the development of innovation, technology transfer, or the support of the process of implementation of innovative projects.

In addition, as a part of the construction of the System it is planned to transform the existing Steering Committee into an advisory body - the Innovation Council, and the creation within the already functioning *Platform mechanisms of cooperation of key industries and the System of Business Environment Institutions.* Their main goal will be the integration of entrepreneurs, collecting information on selected industries, as well as providing comprehensive support for the entities wishing to undertake innovative activities.

The eighth part of the report has been devoted to the system of monitoring, evaluation and updating the RIS LORIS 2030. The purpose of the monitoring system of the Strategy is to increase the level of knowledge of the institutions implementing the RIS LORIS 2030 by building a comprehensive database and information sharing regarding the phenomena of innovation taking place in the Lodzkie Region.

A comprehensive monitoring system in the region will consist of the following elements:

1. Monitoring structures with dedicated resources from both the human and material capital;
2. Reporting system and evaluation system, which defines methods for collecting information on the used indicators, assessments of progress and communicating them to stakeholders;
3. A system of performance indicators of RIS LORIS 2030 objectives, with certain underlying baseline (output) values of indicators and target values. An „appropriate" system of indicators is considered to be a complete and consistent set of measurable indicators, aptly characterizing the adopted goals.

The products of the so designed system will be:

- Primary data collected;
- Reports prepared on the basis of the collected data;
- The conclusions of the reports (submitted to the Regional Government and other stakeholders).

It should be noted that the RIS LORIS 2030 monitoring system will use two types of indicators:

I. *Context indicators* - for monitoring innovation, i.e. the overall situation of the region in this regard. These are the indicators derived from publicly available sources (Central Statistical Office, Eurostat).

II. *Operational Indicators* - indicators aimed at monitoring the actions taken to implement RIS LORIS 2030, which will describe and quantify the objectives of the measures. They are indicators of a product and result manner. The indicators will be derived from the monitoring of projects implementing the provisions of the Strategy and evaluation research.

The system of indicators should be considered in several ways:

- The indicators should be consistent internally and externally;
- The indicators should be „intelligent" (i.e. SMART).

This part of the Strategy also includes the schedule for the implementation of RIS LORIS 2030. This process will be carried out on the basis of three-year Framework Action Plans that will include a list of priority measures and initiatives aimed at creating conditions for the development of innovation and entrepreneurship in the region. In addition, the implementation schedule also includes tasks that require implementation at the beginning of the implementation of this Strategy, as well as the ability to update the Strategy in the subsequent years of its operation.

The last part of this Strategy discusses the main assumptions of the new innovation funding model with the presentation of the financial framework for RIS LORIS 2030, taking into account the different financial instruments.

As a part of the financing of innovative activity in the Lodzkie Region, two main categories of innovation will be supported:

- *Innovation within regional specialisation (locomotives of growth)* - a group of outstanding projects on an international innovation level, belonging to key industries in the region;
- *Basic innovations* - a group of projects with different levels of innovation, contributing to the increase of competitiveness of the enterprises and innovation potential of the region, belonging to the industries operating in the region with the exception of regional specialisations.

While financing the implementation of the Strategy and the business environment institutions supporting the construction of Regional Innovation System will be supported primarily by public funds, the financing of the innovative activity area will offer much more financial mechanisms, including both grant and non-grant. In such a wide range of instruments, a key objective for the new funding model for innovation in the lodzkie region will be to form an appropriate structure to use different sources of funding. This in turn is closely linked to the operation of market mechanisms and the scope of public intervention.

Additionally, key initiatives from the perspective of building an effective and efficient Regional Innovation System for the implementation of RIS LORIS 2030 were presented in *Attachment No 1. Proposals for pilot initiatives.*

Chapter 1

Diagnosis of the situation in the region (including the background of the entire country) in the field of innovation

State of innovation of the Lodzkie Region

Evaluation of the economic and innovative potential of the region

Key conclusions of assessing the situation regarding innovation funding

Presentation of the scientific potential of the region

Analysis of the needs of innovative enterprises in the region of Lodz

Identification of the directions of innovative development of the region, including the leading sectors and technologies

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Lodzkie Region

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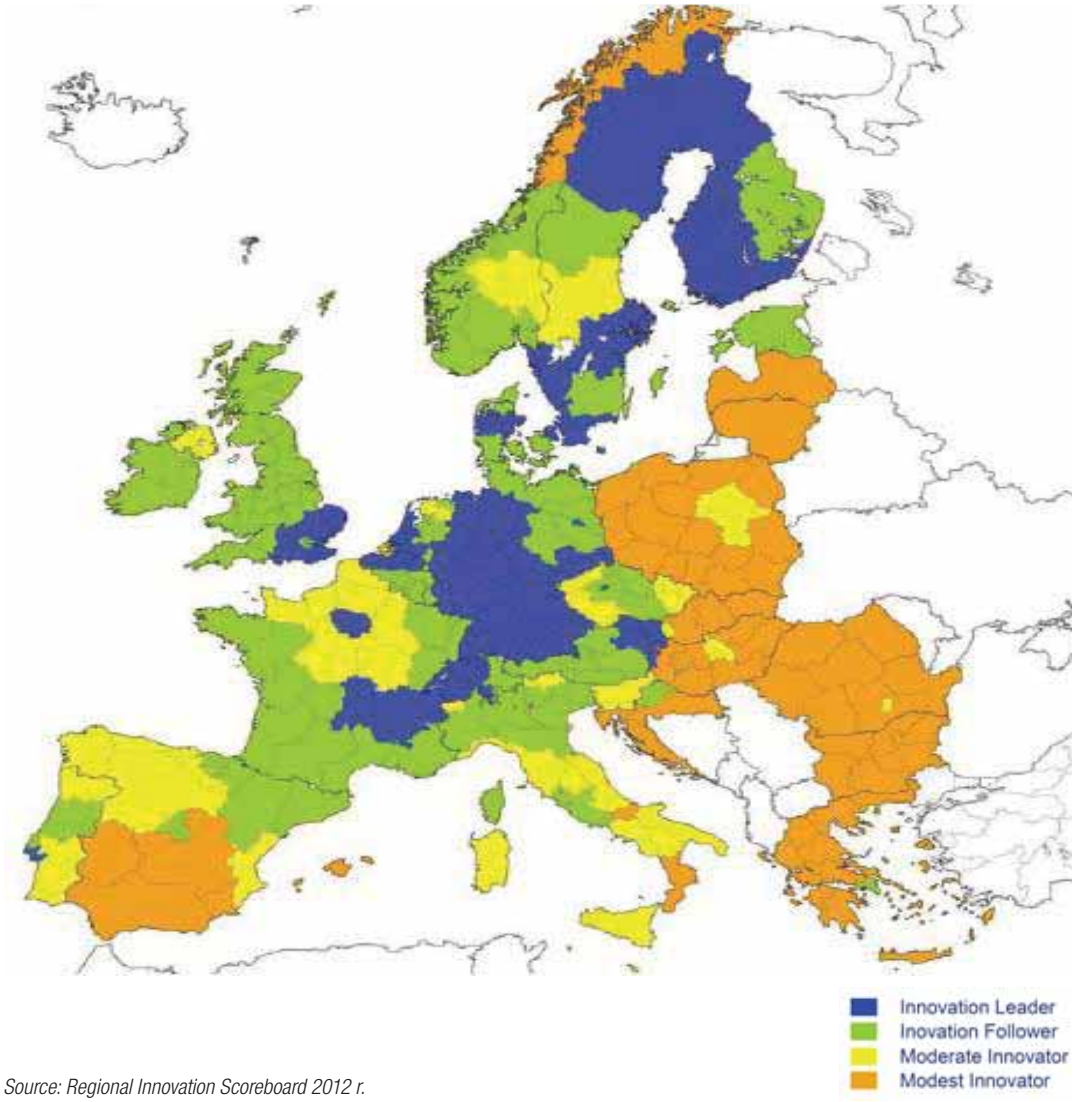
1. Diagnosis of the situation in the region (including the background of the entire country) in the field of innovation

1.1. State of innovation of the lodzkie region

According to the results of the assessment conducted by the European Commission on the basis of the Regional Innovation Scoreboard of 2012, the Lodzkie Region is a modest innovator with a progressive dynamic growth rate of innovation.[6]

Figure 1. The lodzkie region is a modest innovator at the intermediate level according to the Regional Innovation Scoreboard 2012



Source: Regional Innovation Scoreboard 2012 r.

In the European study of regional innovation indicators the voivodeship has improved, compared to the years 2007 and 2009, the results for indicators such as the share of population with tertiary education, public R&D expenditures, business R&D expenditures, non-R&D innovation expenditures, sales of new-to-market and new-to-firm products. The rate of employment in knowledge-based activities remained

6 Progressive dynamic growth rate of innovation is a classification drawn up on the basis of regional innovation by prof. Hanna Godlewska-Majkowska, PhD.

unchanged, as well as the number of patent applications submitted to the PCT. The voivodeship reported worse results concerning indicators such as: the percentage of SME innovators of all SMEs in the voivodeship, the percentage of SMEs cooperating in the past three years as part of any agreement to raise innovation among all SMEs in the region, the percentage of companies that have implemented innovation onto the market on which they operate among all SMEs in the region, employment in sectors of high and medium technology.

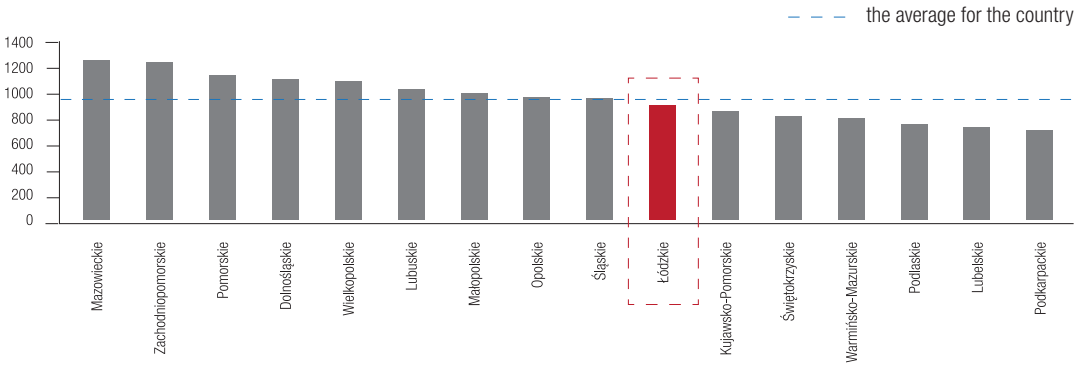
1.2. Evaluation of the economic and innovative potential of the region

The lodzkie region ranks as 9th in the country in terms of size and 6th in terms of population. More than 64% of the population lives in cities. The largest and most dominant city in the region is Lodz. Around 50% of industrial companies, more than 30% of subjects of high and medium-high technology, and more than 50% of business entities are located in the city.[7]

1.2.1. Level of economic development

Compared to other regions, the Lodzkie Region is relatively well developed economically, it is also characterised by a high rate of labour force participation. In 2010, the region provided 6% of the gross domestic product. In terms of GDP per capita, the voivodeship is 6th in the ranking of voivodeships and 3rd in terms of GDP growth per capita. The results achieved place the lodzkie region in the so-called catching-up regions group, i.e. the region's GDP is growing faster than average, but still the value is lower than the national average.[8] The voivodeship is characterised by high dynamics of industrial production compared to the rest of the regions. In comparison to the whole country, the structure of employment in the region is distinguished by a relatively low share of the services sector (55%), while the agricultural and industrial sector accounts for 13% and similarly 31,9% of the employed.[9] According to the REGON registry, in 2011 in lodzkie region operated approximately 6% of all companies registered in Poland.

Figure 2. Average member of entities registered in REGON per 10 thousand people.



Source: GUS, BDL, retrieved on 23.01.2013

7 Update of the Development Strategy for the Lodzkie Region 2020. Project, Board of the Lodzkie Region, 2012

8 Polska 2011, Gospodarka Społeczeństwo Regiony, Project, Ministry of Regional Development, 2011

9 Based on GUS data, and the report POLSKA 2011 Gospodarka –Społeczeństwo – Regiony, MRR, 2011, and the report Atrakcyjność inwestycyjna regionów 2011, prof. SGH Hanna Godlewska-Majkowska, PhD Patrycjusz Zarebski, PhD, 2011

In 2011, 2827 companies with foreign participation operated in the region (an upward trend in the increase of the number of companies and the number of companies financed by foreign capital is visible). Companies with foreign capital in the Lodzkie Region accounted for 4.0% of companies with foreign capital in Poland.[10] The region is dominated by small and medium-sized companies having a low potential for innovation and do not have their own research and development facilities. Most companies are in the group of micro-enterprises, and in comparison to other groups, small businesses have the highest share in the country (6.8%).

In 2011, the position of the Lodzkie Region deteriorated in comparison with 2010 in terms of basic indicators showing the level of entrepreneurship. In 2011, for every 10,000 people there were over 902 businesses registered in the REGON in the voivodeship, which gave the region 10th place in the ranking of voivodeships.[11]

The structure of industry and services is dominated by entities of average and low technology, and less knowledge-absorbing, resulting in a low share of revenues from sales of innovative products for the market in total sales of companies.

Historically rooted, traditional businesses are developing in the region, such as power engineering, textile, ceramic and construction industry, furniture manufacturing, agri-food industry, creative industries,[12] medical and pharmaceutical industry, and other, non-traditional and modern services such as logistics, warehousing, and outsourcing. Information Technology, telecommunications, and home appliances, as well as agriculture and tourism, also show significant potential. One of the most rapidly developing technologies in the region is biotechnology, supported through the implementation of research and development projects, educated human resources, research infrastructure (laboratories) under development. The largest group of specialists in the field of mechatronics in Poland operates in the voivodeship. In addition, technologies such as nanotechnology, functional materials technology, modern design, information technology are rapidly developing.

The lodzkie region is highly rated in terms of attractiveness (4th place in 2010 in the attractiveness for high-tech activity category).[13] Among others, favourable conditions for conducting a business in the voivodeship are in the two Special Economic Zones, such as Lodz SEZ, Starachowice SEZ (Mniszkow subzone). In the Lodz Special Economic Zone, covering an area of nearly 1 277 hectares, 190 investors have a permit to operate. The area brings together businesses of different industries, including ceramics, household appliances, IT, plastics processing, BPO, pharmaceutical, medical, logistics, cosmetics and food industries. The total investment amounted to more than 12 milliard PLN, while the number of jobs created amounts to 23 200 people.[14]

The advantage of the voivodeship is its location at the intersection of two of the four pan-European transport corridors operating on Polish territory and the planned construction of:

- Highway A-2 (Poznań - Warsaw);
- Highway A-1 (Stryków - Kowla, Tuszyn - Piotrków Tryb.);

10 Statistical Year book of Voivodeships 2012, GUS, 2013.

11 Based on GUS data presented in the publications: Działalność gospodarcza podmiotów z kapitałem zagranicznym w województwie łódzkim w latach 2008-2010, Statistical Office in Lodz, 2012, Działalność gospodarcza mikroprzedsiębiorstw w województwie łódzkim w latach 2009-2010, Statistical Office in Lodz, 2012 and Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce, PARP, 2011.

12 To the creative industries include, among others advertising, fashion design, architecture, film and TV production

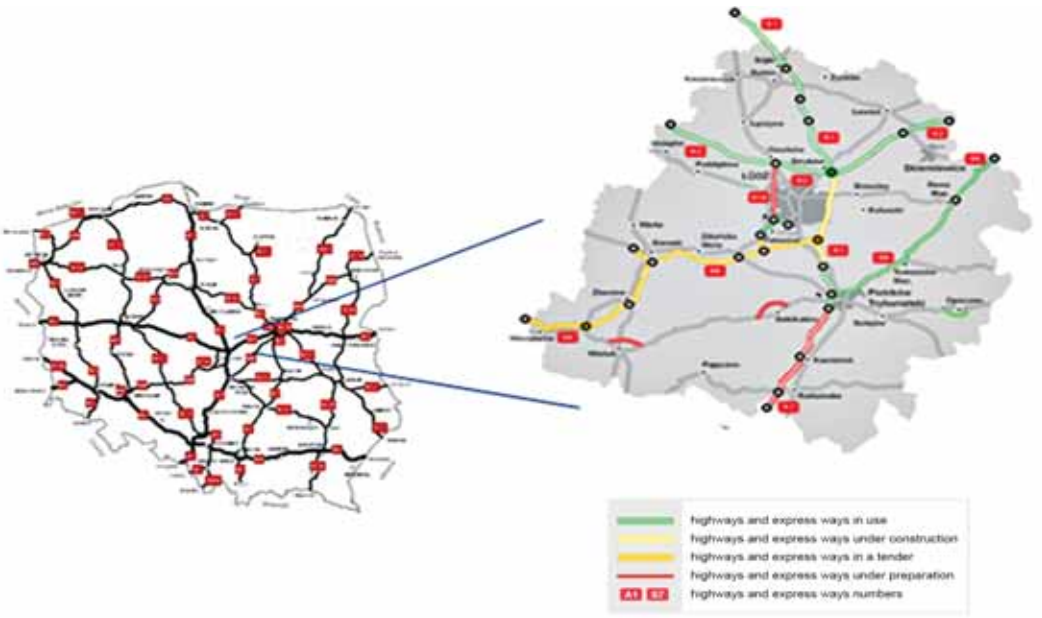
13 Atrakcyjność inwestycyjna województw i podregionów Polski 2010 r., IBnGR, 2010

14 Specjalne Strefy Ekonomiczne po 2020 roku, Analiza dotychczasowej działalności oraz perspektywy Funkcjonowania, E&Y, 2011

- Express road S-8 (Piotrków Tryb. - Warsaw);
- Express road S-14 (DK1 - node „Lublinek").

Bypasses that are created to improve the availability of the region (Krośniewice, Kutno, Rawa Mazowiecka, Opoczno, Pabianice within country roads and a bypass of Stryków within the voivodeship road), and the prepared bypasses of Wieluń and Bełchatów, are also an advantage. The region is relatively well-equipped with public highways. The density ratio of hard surface roads in 2011 was 108.5 km / 100 km^2. The condition of roads is improving, but they still require significant modernisation.

Figure 3. Target system of motorways and express roads (on the basis of a regulation of the Council of Ministers from 20 October 2009[15]) and a map of the state of roads in the lodzkie region[16]



Source: Own study based on GDDKiA.

The railway network in the region is not well developed (density of the railway network – for every 100 km^2 there is only 5,8 km of line with the average for Poland being 6,5 km).

The main problems include:

- lack of main lines of international importance in the TEN-T net running through Lodz;
- lack of good connections to major cities in the country;
- insufficient train speeds;
- obsolete railway junctions.

A hope to improve rail transport in the region is the modernization and revitalization of railroads, the conclusion of a modern multimodal train station in Lodz (Lodz Fabryczna), along with a diametral tunnel Lodz Fabryczna - Lodz Kaliska, integrated with Lodz Agglomeration Rail, consolidated with the construction of a high-speed route Warsaw - Lodz - Wrocław / Poznań rail, the creation of which will be determined by decisions on a national level. The Władysław Reymont Airport, located in the central city of the region - Lodz, will provide for the increasing demand for air transport.

15 Council of Ministers regulation dated 20.10.2009 amending the regulation on the network of motorways and expressways (Journal of Laws No. 187, item. 1446 of 2009)

16 GDDKiA, www.gddkia.gov.pl

As a part of the ongoing revision of the TEN-T (draft of the Regulation of the European Parliament and of the KOM Council (2011) 650 on Union guidelines for the development of a trans-European transport network) two multi-modal platforms in the lodzkie region have been included:

- in the Lodz core network (a platform based on the multimodal Lodz Olechów terminal, the W. Reymont Airport taking the cargo function and areas of a high concentration of warehouse parks),
- in the Stryków comprehensive network (a platform based on the loading station Stryków and areas of a high concentration of warehouse parks).

In addition, multimodal terminals operate outside the TEN-T network - Kutno and Radomsko, and the voivodeship's offer in this regard will be enhanced by the restart of the now defunct Piotrków Trybunalski and Krzew (near Kutno) terminals.

1.2.2. Demographics

The population of the voivodeship at the end of 2011 was 2 533 681 people, which gave the region 6th place in Poland. Currently, Lodz has the largest number of inhabitants in the lodzkie region, with about 725 thousand, which accounted for over 28% of the population living in the region. Subsequent counties in terms of population are: Zgierz (6,5%), Tomaszów (4,8%), Sieradz (4,8%) and Pabianice (4,8%).[17] Rural areas are inhabited by 918 thousand people, which represent 36% of the total population.

The region has a higher than national average labour force participation rate and a lower than average unemployment rate. The average employment in the enterprise sector in the Lodzkie Region in 2011 was at a higher level than the previous year by 5,0% and amounted to 325,9 thousand people. The increase in the average number of employees was noted in all sections of the enterprise sector.

Table 1. Basic indicators of economic activity of the lodzkie region

	2005	2008	2011	Poland (2011)
Economic activity rate	54,3%	55,7%	57,5%	56,1%
Employment rate	45,3%	52,3%	52,1%	50,8%
Unemployment rate according to BAEL	16,7%	6,0%	9,3%	9,7%

Source: Raport o sytuacji społeczno-gospodarczej województwa łódzkiego 2011r. p.21, Statistical Office in Lodz, 2012.

The lodzkie region was inhabited by 354 511 people of pre-productive age (i.e. the ages between 0 - 17 years old) at the end of 2011. People in this age group accounted for 13% of the voivodeship's population and it is one of the lowest values among other regions. The working age group accounted for 66,6% of the voivodeship's population (63,8% in 2010). There were 491 488 people in productive age, which accounted for 19% of the population. The lodz region was ranked in 11th place among the other regions as a share of working age population.

In referrence to the total number of people working in Poland, people employed in the lodzkie region account for about 7% of the total. The sections with the largest number of working people are:

- The industry and industrial processing (43% in 2011);
- Trade, repair of motor vehicles (15% in 2011);
- Education (7,3% in 2011).

17 GUS, BDL, retrieved on 01.02.2013 r. population according to the actual place of residence.

The region maintained a downward trend in terms of population, mainly due to negative natural growth. According to the latest demographic projections of the Central Statistical Office for the period 2008 -2035, in 2030 there will be 2 274 636 people living in the region, about 260 thousand people less than in 2011. There is a negative population growth and negative net migration in the voivodeship.

Table 2. Selected indicators regarding the population.

	2005	2008	2011	Poland (2011)
Population growth per 1000 people	-3,21	-2,05	-2,47	0,34
Net migrations (internal and abroad - permanent stay) per 1000 people	-0,59	-0,62	-0,77	-0,11

Source: Raport o sytuacji społeczno-gospodarczej województwa łódzkiego 2011, p.21 i p.90, Statistical Office in Lodz 2012

1.2.3. Human capital resources

Human capital of the region is rated very highly. The high rating is due to good scientific research facilities represented by strong universities on a nationwide scale, as well as research institutes and a strong academic staff of technical universities and academic fields such as medicine (more than 20% of university teachers with the national average at 10%) and artistic faculties (almost 8% of university teachers with the national average at 4%).[18] Lodz is the main academic centre. Among the city's tertiary education institutions are: the University of Lodz, two technical universities, five economic universities, a medical university and four art schools. The largest and most important universities in Lodz are the Medical University of Lodz, University of Lodz, and the Lodz University of Technology, and the other strong academic centres outside of Lodz are Piotrków Trybunalski and the subregion of Skierniewice. In 2011, a total of 95 417 people studied in Lodz, and 25 878 people received a university degree. The largest number of people studied at administrative and economic faculties, such as finance, and accounting and management (approximately 6 250 graduates in 2011), i.e. 25% of all graduates from Lodz. Subsequently, one of the most popular faculties was pedagogy (18% of all graduates of Lodz) and medical faculties. The number of graduates in engineering and technology in Lodz in 2011 was 1418. For several years, a growing interest in technical studies has been noticeable (for comparison, in 2005, 756 graduates graduated from engineering and technical faculties). In terms of the number of doctoral students the voivodeship ranks 6th in the country. In the period 2007-2009 an increase in the number of study participants in the field of engineering, chemistry and medicine was visible.[19] At the same time, an important issue in the whole voivodeship is the lack of well-trained technicians and craftsmen, as well as inflexible curricula, unadjusted to the needs of the labour market. Therefore, it is necessary to strengthen the cooperation between universities, schools and entrepreneurs in the selection of courses and in determining curricula, and the organization of apprenticeships and traineeships. In addition, it is necessary to include in the curriculum elements that will shape the students' creative and pro-innovation attitudes, and encourage them to make and realize their own ideas and take risks in doing business.

1.2.4. Technical equipment of scientific and research entities

The research and development sphere is characterised by inadequate investment in technical equipment and machinery. Scientists use old, worn down equipment (equipment wear indicator, i.e. the ratio of wear

18 GUS, BDL, retrievedon 22 01 2013.

19 Kapitał ludzki województwa łódzkiego, badania wykonane przez Hays Polska, Outsourcing & more, July / August 2012.

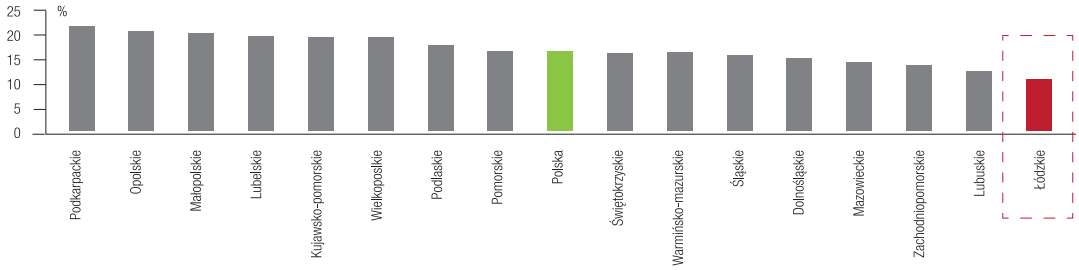
to the percentage of the gross value of fixed assets increased in the lodzkie region in 2007-2010 from the value of 76,7% to 81,7%),[20] which limits the possibility to conduct research at a level similar to scientists from more technologically advanced countries. Despite the shortages of modern equipment, the research centres in Lodz stand out in Poland and are visible to the world due to advanced research in areas like biology, chemistry, physics and technology of polymers and their use in the manufacture of plastics and synthetic fibres. The region is predestined to become a bioregion, especially because of the rapidly growing biotechnology industry. It should be noted that currently there are 93 investments realised in the field of science and tertiary education with a value of 1 314 310 225,08 PLN[21] in the voivodeship, some of which relates to the upgrading and modernisation of research infrastructure, which may improve the quality of research in the future.

1.2.5. Innovative activity of enterprises

In Poland, there is considerable inter- and intra-regional variation of enterprise innovation activities. The difference between the highest and the lowest percentage of the most innovative industrial companies in voivodeships is 9,9%, and for companies from the service sector - 7,6%. This difference is higher than in the previous period considered (2008-2010), when the difference in innovation level between the voivodeships both among industrial enterprises, as well as enterprises from the services sector, amounted to approximately 7%. From the perspective of voivodeships, relatively the most active in innovation and innovative companies in the industry occurred in the years 2009-2011 in the Podkarpackie Voivodeship (respectively 22,2% and 21%), while companies in the service sector - in the Masovian Voivodeship (16,3% and 15,6%).

In the lodzkie region, less than 10% of companies conduct innovation activities (innovative industrial enterprises - 11,1%, innovative service companies - 8,5%).

Figure 4. Innovative companies in the industry in the years 2009-2011

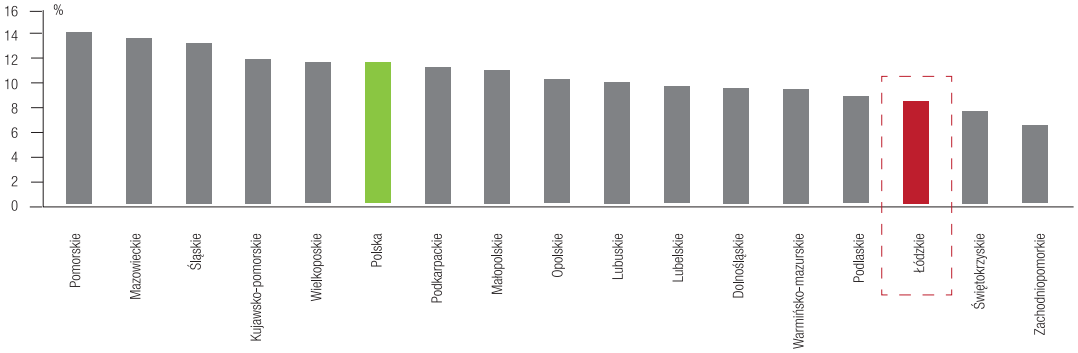


Source: Działalność innowacyjna przedsiębiorstw w latach 2009-2011, GUS, publication dated 5.12.2012

20 Nauka i technika w 2010 r. GUS, 2012.

21 A map of the investment in the areas of science and higher education, website of the Ministry of Science and Higher Education: http://www.nauka.gov.pl/ministerstwo/inwestycje-w-obszarze-nauki-i-szkolnictwa-wyzszego/

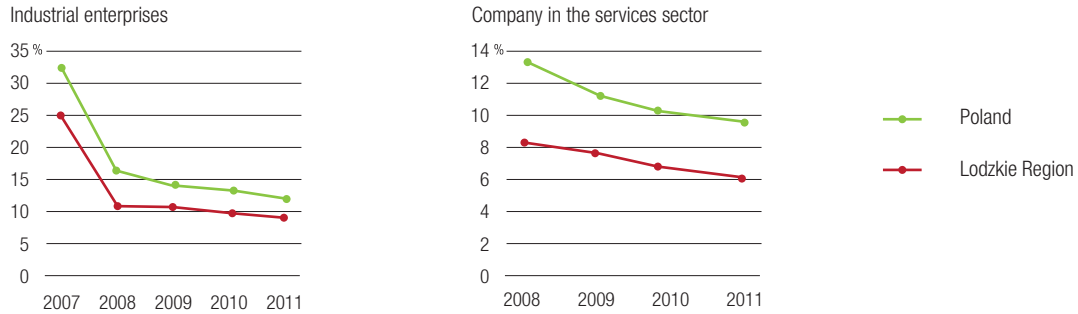
Figure 5. Innovative companies in the service sector in the years 2009-2011



Source: Działalność innowacyjna przedsiębiorstw w latach 2009-2011, GUS, publication dated 5.12.2012

Among the most innovative industrial companies are large enterprises (approx. 61%), about 25% are medium-sized, and 5% are small. Small innovative activity of businesses mainly concerns every type of innovation, i.e. product, process, organisational innovations and (little more enterprises introduced marketing innovations).[22] In 2011, the expenditures attributable to one industrial company, which spent funding for innovation activities, averaged to PLN 5 167,8 thousand PLN in the country, and for one company in the service sector - 5 004,1 thousand PLN.

Figure 6. Enterprises which incurred expenditures for the innovative activity



Source: GUS, BDL, publication dated 22nd January 2013.

The lodzkie region performs well in such an approach, since expenditures attributable to one industrial company amounted to PLN 8 681,3 thousand and were the highest in the country, and for one company in the services sector – PLN 748,8 thousand PLN (increase in relation to the previous period 2008 -2010, when the expenditures for innovative activity of the companies in the services sector amounted to 569,6 thousand PLN).

Table 3. Expenditures for the innovative activity of enterprises of lodzkie region in 2012

	Total expenditures	Expenditures on R&D activity in the total expenditures	Capital expenditures[24] in the total expenditures
Industrial enterprises	PLN 2300,5 million	PLN 166,4 million (7%)	PLN 1 858,5 million (80%)
Enterprises from services sector	PLN 65,9 million	PLN 9,7 million (14%)	PLN 44,4 million (68%)

Source: GUS, BDL, publication dated 22nd January 2013.

22 Marketing innovations were introduced by 10% of the industrial enterprises from Lodzkie Region (3rd place on the national level) and 6,5 % of the enterprises from the services sector (10th place on the national level). Działalność innowacyjna przedsiębiorstw w latach 2009-2011, GUS, publication dated 05.12.2012

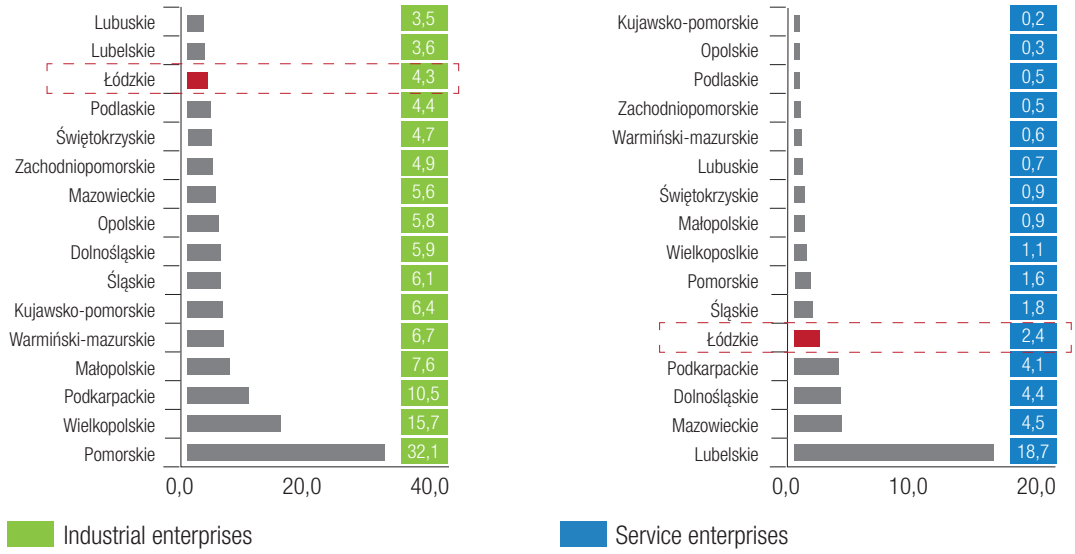
23 Buildings and land, plant, machinery and technical equipment

Most of the funds were spent on the capital expenditures such as the purchase of machinery and equipment, means of transport, tools, appliances, furniture and equipment, while the least - on staff training related to innovation activities and the purchase of external sources.

Public support for innovative activity may come from national institutions (among others, from the local level units and central level units) and the European Union (among others from the 7th Framework Programme for research and technological development). In the years 2009-2011, 25,6% of innovative industrial companies received public support for innovation activities. 33,9% of innovative companies in the services sector in the region received public support. Most of the industrial companies gained funds from the programmes for the support of investment and R&D activity, whereas in case of the companies from the services sector – for the support of R&D activity.

Revenues from sales of new or significantly improved products in the total revenue from the sale of in the innovative industrial enterprises amounted to 4,3% (decrease in relation to 6,7% in 2010), while for service companies to 2,4% (increase in relation to 1,1% in 2010).

Figure 7. Revenues from the sale of new or significantly improved products in the industrial enterprises (left) and in the enterprises from services sector (right) in 2011



Source: Działalność innowacyjna przedsiębiorstw w latach 2009-2011, GUS, publication dated 05.12.2012.

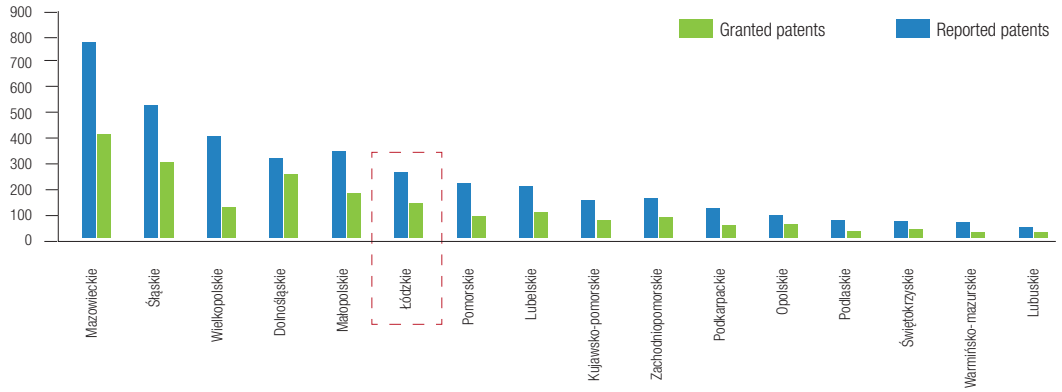
Enterprises primarily implement those innovations, which modernise existing production processes and increase productivity. The number of production automating processes, such as new, automatically controlled product lines, industrial robots and manipulators, computers for the control and regulation of technological processes, has increased in the case of some measures in relation to 2007 by up to almost 200%.[24]

Research and development is carried out by companies in a very limited scope and usually by the largest companies with significant financial resources. Companies primarily use their own research and development resources, or benefit from the aid of individual researchers. More than half of companies do not see the need for research, and the most common method of technology transfer is to purchase ready-made technology. An important element in the innovation process is the adequate protection of

24 Own calculations based on GUS data

new products and technologies. Polish entrepreneurs rarely try to obtain patents for their inventions, in recent times slightly more likely to use forms of industrial property protection in the form of utility.

Figure 8. Reports of inventions and granted patents in 2011

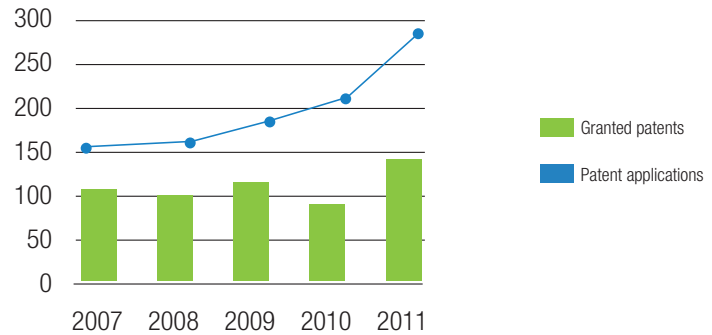


Source: GUS, BDL, publication dated 22nd January 2013

According to Polish Patent Office, the number of the patent applications in lodzkie region is constantly increasing.

Lodzkie region remains active within the scope of intellectual property protection also in comparison with other voivodeships. Having 339 patent applications and applications for utility models in 2011, it was 6th in the country; as far as the number of granted patents and utility models is concerned - it was even 5th in the country.

Figure 9. Number of patent application and granted patents in the lodzkie region in years 2007-2010



Source: Own development on the basis of GUS, BDL data, publication dated 25.01.2013

However, most of the patent applications and applications for utility models are made by PAN units, research institutes and universities (in 2011 – most of the reports of innovations and for utility models in lodzkie region were drawn up by Lodz University of Technology – 65 applications). In years 2008-2010, 1% of the industrial enterprises and 1,8% of the enterprises of services sector gained patents. Among the potential difficulties occurring in connection with the conduct of innovative activity and commercialization of the new technological solutions, the entrepreneurs mostly indicated a lack of financial resources, lack of proper competences and knowledge, e.g. within the scope of offer of research centres.

1.2.6. Information society

In the central macroregion, which includes the lodzkie region, 68,2% of households have access to broadband Internet.[25] The percentage of people who have never used a computer has decreased by 22% over the years 2007-2010, and it is now 33% in the central macroregion.[26] A study of the innovative potential of the Lodzkie Region in the terms of ICT within the framework of the project „Capital of Innovation 2009. Updating the Regional Innovation Strategy in the Lodzkie Region", implemented by the Marshal's Office Department for Information Society in Lodzkie Region, shows that the annual growth rate of users (for the entire voivodeship's population) who use the Internet is about 3%. The fastest growth can be observed in the elderly (those over the age of 50) and low-educated, but still more than half of people over the age of 50 do not use the Internet, and among the seniors (above 60 years of age), this percentage reaches 80%.

People who have been using the Internet the longest are primarily school pupils and well educated people (90%). Among those with primary education (with the exception of learners), and vocational education, nearly 70% of them do not use the Internet. Diversity also exists between urban and rural areas, in favour of the former. In the rural areas the percentage of people that do not use the Internet is the largest and reaches 60%. The main obstacles of the spread of ICT technologies in society are above all soft barriers - mental and competence barriers.

Over 90% of companies in the region use ICT technologies. Entrepreneurs often use ICT services to serve business customers (70,9%) and for the implementation of trade (50%); also a significant part of entrepreneurs use the Internet and the computer for activities in areas such as cooperation with authorities (48%), finance and legal news (47,2%), human resources management (45,3%), promotion and marketing (42,9%). Very rarely, ICT services are used in the management of production (only in every fourteenth company). Entrepreneurs in the lodzkie region make little use of more advanced ICT services such as dedicated specialist software. Having a website or online store is still not widespread, although most traders say they are willing to set them up.

The degrees to which the education system is equipped in ICT tools and technologies are very diverse. Schools can be divided into two groups in this respect:

- Relatively well-equipped universities.
- Poorly equipped primary schools, middle schools, high schools.

Universities are relatively well equipped with ICT tools and technologies, but there are evident differences depending on the type of institution and faculty. Often the ICT resources owned by them are outdated. Due to the lack of financial resources it is difficult to purchase new equipment. Thus the students who finish their education are not well prepared for work, i.e. not provided with appropriate practical skills corresponding to the requirements of the labour market.

Among the problems associated with the use of ICT technologies in tertiary education are primarily competence and mental barriers of senior some university staff, poor flow of information about the opportunities offered by new technologies due to the lack of an information campaign on the part of those responsible for the implementation of new solutions for universities on the one hand, on the other hand the lack of technical channels of communication between faculties or within the faculty. Universities could make use of EU subsidies more often, however, the complicated and long application system, the lack

25 Wykorzystanie technologii informacyjno-(tele)komunikacyjnych w przedsiębiorstwach i gospodarstwach domowych w 2012 r., GUS, publication dated 31.12.2012

26 Społeczeństwo informacyjne w liczbach, Ministry of Administration and Digitisation, 2012

of the sufficient number of people at the university delegated for the aforementioned tasks, as well as difficulty in ensuring own contribution result in the fact who are able to fill in the documents, and unclear criteria for the evaluation of projects are so daunting that this opportunity is not always fully used.

Primary schools, middle schools and high schools are in a much worse situation in terms of equipment and ICT tools than universities. In terms of equipment, such as computers and multimedia tablets, the situation is not satisfactory. For one educational institution, on average, there are 26 desktop computers and 3 laptops. Students have very limited access to computers in the classroom (approximately 1 machine per two students), and little leisure time. About 22% of the studied entities have various types of multimedia equipment. On average, per one school there are 2,2 multimedia projectors, 3,6 DVD players, and 4,6 televisions. Contact between schools and parents by the traditional form of communication - the phone - is primarily used; only a small percentage of schools surveyed use the Internet.

Similarly, a low level of competence in the use of ICT occurs in public administration. 83% of offices have broadband access to the Internet, and most have the basic tools of ICT (internal computer network, private server, specialist software), but most of the petitioners stakeholders are contacted personally via telephone, e-mail and traditional post. Online forms and instant messaging are not used. Two thirds of the offices do not use the system of electronic circulation of documents (EOD). Almost 89% of the systems used by the authorities are not part of a broader system used jointly by a greater number of individuals. According to half of the respondents-officials, ICT investments are associated with an increase in the number of procedures in the office and an increase in the amount of work to be done. The aforementioned situation is a result of the double circulation of documents, i.e. paper and electronic one, conducted by most of the offices (86% of the offices indicate that such a situation takes place very often and concerns more than half of the cases).[27]

In the lodzkie region, currently implemented is the project entitled “Metropolitan Network of Broadband Internet Access - MSSDI” (2009 - 2010, implementation time: July 2009 – March 2013) which aims to increase the quality of the services provided by the public administration. Other projects, important from the point of view of information society development, include “Infrastruktura regionalnego systemu informacji przestrzennej województwa łódzkiego” (Infrastructure of the regional system of spatial information of Lodzkie Region), “Regionalny System Informacji Medycznej” (Regional System of Medical Information); also the implementation of public e-services project of the Lodzkie Region “Wrota Regionu” was started.

1.2.7. Cooperation in the field of innovative activity

Cooperation between companies and research centers, suppliers, universities, consulting firms provides access to a wider knowledge and new technologies, and fosters the exchange of knowledge and experience. It also allows to reduce the costs and risks of business activities. Cooperation may take many forms, the most common include partnerships, alliances and joint ventures with external entities, or the acquisition of knowledge in the way of an agreement to conduct R&D, or purchase a license. Both in industrial and services sector, as the main partner in the cooperation in the field of innovation were suppliers of equipment, materials, components and software. Amongst all companies in the region one of the above forms of cooperation undertook 4,4% industrial enterprises and 3,1% of companies in the service sector.[28] The situation looks different among the companies that are active innovation. Cooperation in innovation

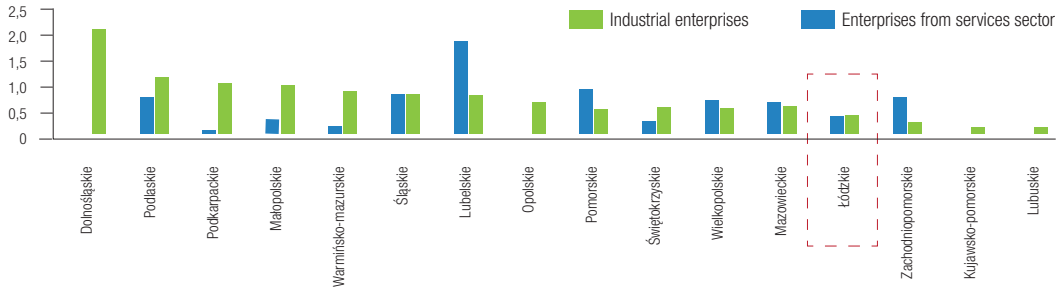
27 Badanie potencjału innowacyjnego województwa łódzkiego w zakresie ICT – identyfikacja luk kompetencyjnych. Raport z badania, Stowarzyszenie „Miasta w Internecie”, Społeczeństwo informacyjne w liczbach, MAC, Departament Społeczeństwa Informacyjnego, Warsaw 2012

28 Działalność innowacyjna przedsiębiorstw w latach 2008-2010, GUS, 2012

activities in 2009 - 2011 conducted 37,8% of innovation active enterprises and 36,4% of industrial companies in the service sector. Number of companies cooperating with the innovative activity increased compared to years 2008 - 2010. Cooperation, however, concerned primarily large enterprises.[29]

Under the cluster initiatives cooperated 0,3% companies (7,4% for industrial companies cooperating in the innovative activity, and 9,1% of companies in the service sector in the framework of co-innovation).[30]

Figure 10. Enterprises which cooperated within the scope of innovative activity within the frameworks of cluster initiative in years 2009-2011 according to the voivodeships



Source: Działalność innowacyjna przedsiębiorstw w latach 2009-2011, GUS, publication dated 05.12.2012

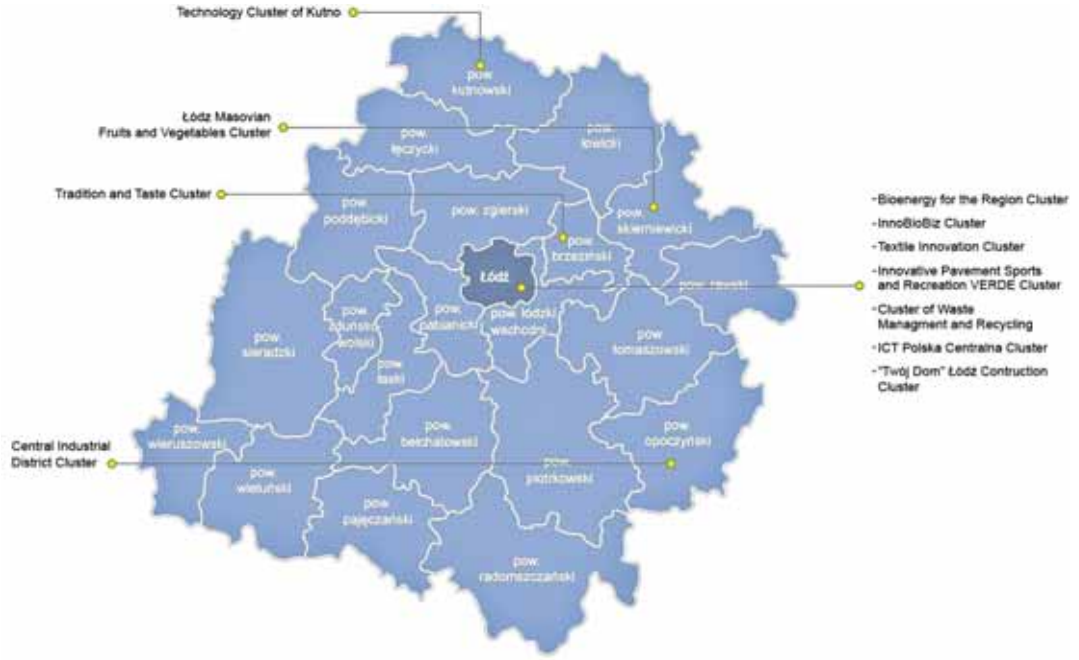
This form of cooperation is not popular despite the favourable conditions for development existing in the region, which may to some extent be a result of insufficient knowledge of the issues and the significance of clusters among local governments, their lack of promotion and lack of awareness of the benefits businesses can gain from this form of cooperation. Currently, most of the clusters are in the early stages of development – at the stage of the so-called cluster initiative.

10 cluster initiatives have been recorded in the lodzkie region, most of which are located in Lodz, furthermore one of the cluster initiatives was identified in Skierniewice (Lodz-Masovian Fruits and Vegetables Cluster) the next in Kutno (Technology Cluster of Kutno) and one in Opoczno district (Central Industrial District Cluster). Cluster initiatives operate in the sectors recognized as of key-importance in the region (textile industry, food, construction or energy).

29 Działalność innowacyjna przedsiębiorstw w latach 2009-2011, GUS, 05.12.2012

30 Ibidem

Figure 11. Cluster initiatives in the lodzkie region



Source: Own study.

The first clusters were created in the lodzkie region between 2007 and 2008. At the time, including with the participation of the Marshal's Office were created: Lodz-Masovian Fruits and Vegetables Cluster, Bioenergy for the Region Cluster, Cluster BioTechMed Cluster, Textile Innovation Cluster, Advanced Technologies of Textile and Clothes Cluster, Media Cluster. The following year to this group also joined the cluster initiatives: Housing of Polish Central Cluster, Cluster of Horse Tourism and Tradition and Taste Cluster. Unfortunately, the year 2010 proved to be the end of the initiatives mentioned above. As the main cause of failure was given the lack of funds for their activities. In addition, strong problem was the lack of substantial preparation for clustering by the leaders of the various initiatives. In 2011 could be seen the re-intensification of activities leading to the creation of clusters in the lodzkie region. The new pool of funds under the Innovative Economy Operational Programme mobilized environment centered in the following industries: textile, engineering or biotechnology and pharmaceutical industries for action. The result was signing of letters of intent under: Fashion Industry and Innovation Cluster, InnoBioBiz Cluster, Technology Cluster of Kutno and Innovative Pavement Sports and Recreational VERDE Cluster. In addition, in 2012, were established three new initiatives: Cluster of Waste Management and Recycling, ICT Central Poland Cluster and Central Industrial District Cluster.

In the future, clusters could significantly affect the diffusion of innovation, and support the process of establishing the relationship between the sphere of science, business and local authorities.

Cooperation of businesses in the lodzkie region with R&D institutions is very limited in scope and intensity. This co-operation takes place mainly in medium and large enterprises, as well as those located within the broadly understood Lodz metropolitan area. Among the companies in the smaller towns and the countryside, contacts with R&D entities are almost non-existent.

For innovative companies in the lodzkie region the main source of information about innovation are internal sources (38% of services enterprises and 42% of industrial enterprises); in terms of external

sources, those related to market relations, i.e. suppliers, customers, and in part also competitors, are dominant. R&D entities are the source of information for a very small group of innovative companies (for about 4% of enterprises in the service sector and about 10% of industrial enterprises).[31] Among the forms of cooperation conducted by companies and R&D institutions, various forms of soft contacts, involving mainly training and education, are dominant.

Services supporting the innovation of economy and technology transfer in the lodzkie region are provided by business environment institutions. Their structure is quantitatively well developed compared to the nationwide situation. The centres strictly involved in fostering innovation of the regional economy include:

- Two technological parks (Lodz Regional Park of Science and Technology, Bełchatów-Kleszczów Industrial and Technology Park).
- Two incubators of technology (Lodz Technology Incubator at the Lodz Regional Park of Science and Technology, Technology Incubator at the Bełchatów-Kleszczów Industrial and Technology Park).
- Four technology transfer centres (Technology Transfer Centre of the Technical University of Lodz, Technology Transfer Centre of the University of Lodz, Medical University of Lodz Technology Transfer Centre, Business Innovation Development Centre in Lodz).
- Four academic pre-incubators and incubators (University of Lodz Innovation Centre Incubator - Lodz Technology Accelerator, Technology Incubator ARTERION in Lodz, Academic Business Incubator - Lodz University of Social Sciences, Academic Business Incubator - University of Lodz).
- Four business incubators (Regional Development Agency Kutno, Poddebicki Business Incubator, Zelowski Business Incubator, Kleszczów Business Incubator).

During the analysis of the availability of the centres' services, the number of inhabitants in the region has been juxtaposed with the number of centres, and the number of companies has been juxtaposed with the number of centres. There is an average of 52,8 thousand inhabitants of the voivodeship and 4761 companies per one centre, regardless of its type, which ranks the region's situation slightly below the national average.[32]

Among the specialized services offered by the centres of innovation in the lodzkie region, services aimed at promoting innovation and advisory support and information of existing businesses, related to innovation in the region, and to a lesser extent at the financial support of innovative new ventures, are dominant in the region.

The weakness of the regional infrastructure of the innovative business environment is their high concentration in the Lodz agglomeration (with 16 centres, 10 of them work in the Lodz agglomeration), while the lack of innovation centres in cities with a certain academic and industrial potential is noticeable (Skierniewice, Piotrków Trybunalski, Tomaszów Mazowiecki, Radomsko, and Sieradz, Łowicz, Wieluń), as well as excessive individualism and competition among existing institutions. Other problems include the small scale of operations and weak financial and organisational base of institutions, the lack of experience in the field of technology transfer, poor contacts with the academic, research and business spheres, as well as weak cross-regional and international contacts. The university CTT centres particularly are not adequate with their potential in terms of employment and business profile with the potential of the university, which they handle. Attention should be paid to the potential and scope of activities of the Lodz Regional Park of Science and Technology in Lodz rising since 2012, which makes this centre a leader in

31 Based on Działalność innowacyjna przedsiębiorstw w latach 2008-2010, GUS, 2012, and field research conducted among entrepreneurs in the lodzkie region

32 Ośrodki innowacji i przedsiębiorczości w Polsce. Raport 2012, PARP, 2012

high technology transfer system (biotechnology) in the lodzkie region. Activities of the regional sphere of entrepreneurship and innovation centres are poorly coordinated. There is especially a lack of coordination between the activities related to technology transfer and entrepreneurship, and support for innovative projects. Activities taken up in the field of technology transfer are not sufficiently supported by policies in the area of innovation and entrepreneurship, which in turn builds an insufficient area of research, innovation and technology transfer in the region, thus not creating the so-called innovative business environment, not supporting effectively the building of a modern labour force (human capital), and not supporting knowledge transfer mechanisms.

1.2.8. Analysis of the external conditions, internal barriers, negative and positive conditions for the commercialisation of technology transfer in the region

Innovative activity is developed mainly internally within a company, using its own resources, skills and ideas. This applies especially to the smallest companies implementing rules for small-scale innovation and modernity, requiring greater cooperation with the environment, often using imitation as a source of new solutions. However, a small percentage of companies develop innovations, searching for new sources of knowledge, services for innovation. This situation applies mainly to larger companies (including large and medium), and which operate in more modern sectors of activity.

The analysis shows that, in the lodzkie region, using the services of the broadly defined technology transfer is limited, however, very diverse. About 1000 businesses make use of such services in a systematic and formalised way, which represents approximately 1% of all active business innovation. In this group, there are 700-800 companies active in the fields referred to as advanced technology or creative industries.[33] There are also new, small academic businesses in this group - a few so far, an estimated total of several entities (according to estimates in the last 10 years, 50 university spin-off companies have been established in the lodzkie region, of which only two are formal), operating in high-tech areas, often associated with preferred specialisations of the region. It is primarily these entities that report the need for development of new and specialised transfer services in the region in the form of better access to the databases of the entities and institutions - as a source of innovation, as well as partners to implement innovative processes. Contacts of a trans-regional and international level are also important for these companies, because of the nature of the business, the need to compete in innovative products or services on the market.

The vast majority of local businesses use the transfer services in the region, at most, occasionally (and informally), or do not need such services and often do not have the awareness (beliefs) about the opportunities offered by external cooperation in the field of innovation. Moreover, they also do not even know about the existing institutional solutions and offers of services in the region. As a rule, this group of companies, not innovative or weakly innovative, requires the provision of general services for the simple transfer of technology, such as information about the sources of innovation in the region, individuals (and their offer) providing transfer services, and above all, the conviction of opportunities and benefits in cooperating with the environment in the field of innovation. None of the surveyed non-innovative companies in the SME sector of the lodzkie region had knowledge about the functioning of specialised centres of innovation (technology parks, incubators of technology, technology transfer centres). More than half of the companies estimate that the region of Lodz does not constitute an innovation centre for them (this applies more to the companies outside the Lodz agglomeration) in terms of sources of innovation, capacity and expertise of local partners, as well as the quality of services in support of innovation. However, in reality only a small percentage of companies (less than 2% of all entities) actively

33 Based on own research, conducted by Prof. Assoc. Edward Stawasz and phD Pawel Glodek

seeks (and finds) necessary services outside the region. This group of companies requires the facilitation of contacts of a supra-regional and international character.[34]

1.2.9. Driving forces and barriers in the development of innovation and technology transfer in the region

The development of a system of technology transfer in the lodzkie region is influenced by the characteristics of the two categories with different impact direction, i.e. the motor forces and barriers. The aforementioned characteristics are summarized in the form of a table and presented below.

Table 4. Driving forces and barriers in the development of innovation and technology transfer in the region

Driving forces	Barriers
Structural factors	
European Funds in the programme period 2007-2013, creates new funding opportunities for projects serving various forms of economic development, including the development of entrepreneurship, innovation, technology transfer, development of innovation centres, pro-innovation services, education, training, etc. The conversion of the local business for new growth factors based on the latest technological thinking, increased spending on know-how and human resources resulting from the depletion of extensive growth opportunities. Previews for the new programme period of the European Union (2014-2020) show an increase in the concentration of financial resources for research, development, innovation, technology transfer and commercialisation of knowledge. Developing the potential of innovation centres (Lodz Regional Park of Science and Technology in Lodz).	Low level of consolidation of technology transfer system and its individual cells. Low adaptive flexibility of universities and other R&D entities. The low level of organisational preparation of universities to take up tasks in technology transfer and commercialisation at the level of their potential knowledge. Inadequate capacity and lack of coherence of the profile of innovation centres to handle the transfer of technology for the development of the regional economy (regional specialisation and functional areas). Instability of operation stops innovation centres from developing specialised competencies regarding, among other things, technology transfer. They tend to focus more on the provision of standard services (training, writing and overseeing applications, preparation of conferences, etc.) and the acquisition of current financing. Immature market for new business ideas, the lack of local market demand for innovative products narrows the transfer services market. „Imitative" (arbitral) nature of regional enterprise solutions focused on the adaptation of solutions proven and verified in more developed countries and concerning the complementary imports of components, facilities, machinery and equipment, fairly widespread copying, etc. - determines the transfer market profile. Few places and opportunities to build cooperation.

34 Ibidem

Systemic factors	
System-wide change, entrepreneurship, the inflow of FDI, Polish accession to the EU, which resulted in an increase in competitive pressure in the economy of the region, significantly changing the conditions of the local business and adding pressure to the need for innovative behaviour. The update of the Development Strategy for the Lodzkie Region 2020 focuses on economic cohesion of the region through, among other things, the development of science and research, and technological restructuring of the economy, as well as the formation of networks between universities, research institutions and enterprises.	Lack of a coherent vision of the key animators of economic life, of how the regional innovation policy could translate into socio-economic development, the lack of cohesion with the particular policies of development of functional areas in the region. University bureaucracy and a lack of understanding of the changes and the search for new organisational solutions Excessive formalisation of support mechanisms, leading to the expenditure of funds in accordance with procedures, and not achieving developmental objectives.
Cultural and awareness factors	
Supporting the academic enterprise provides the chance to break the general pattern of thinking that commercial attempts are contrary to the principles of scientific and research work, and thus inappropriate for representatives of the scientific community.	The low level of public trust and a lack of real partnership in mutual relations create barriers for collaboration and forming mutually beneficial projects in the economic sphere (in particular, regarding micro-enterprises). Insufficient level of social trust creates barriers for collaboration and undertaking projects in the field of science and research. Lack of trust between partners creates significant barriers for collaboration and making projects in the sphere of science-economy. Lack of understanding of the need for cooperation with partners from the economic sphere among research staff. Lack of real advantages for entrepreneurs from cooperating with the sphere of research at the existing research system. Understanding of the need for cooperation with the sphere of science and research among research staff. Inequality and lack of tolerance on the labour market, also among the research workers of the universities and R&D entities, especially concerning women and young people.
Competence factors	
Internationalisation of innovation and participation in international projects increase knowledge about the models, processes and strategies relating to the transfer of know-how and technology, build skills to move around on international markets. The increase in experience and competence of managers and owners of Polish companies in the areas of new product development policy, marketing, financial management and knowledge management.	Lack of specialists in the field of the entire technology commercialisation process. Lack of practical knowledge and experience in the field of technology commercialisation process among the actors of the process - research staff, staff of enterprises (mainly SMEs) and individual institutions of the business environment. Enterprises, public administration, R&D institutions, centres of innovation - work in relative isolation, do not know much about the others' offer and the needs of other parties. Lack of knowledge on the use of efficient procedures for the transfer of technology.

Source: On the basis of own studies of Prof. Assoc. Edward Stawasz and phD Paweł Głodek conducted in the region as well as on the basis of available literature.

The presented analysis of the factors associated with the observed motor forces and barriers in technology transfer in the lodzkie region indicates superiority of barriers over the motor forces and applies to all areas of the system.

1.2.10. The role of local authorities in the development of innovation

The efficient functioning of the government in the region is extremely important for the development of entrepreneurship and innovation. Based on interviews conducted among entrepreneurs, representatives of the business environment, as well as representatives of the scientific sector, it can be said that the support of the administrative authorities at various levels requires extension according to the expectations.

The main problems include:

- Difficulty in the development of proper criteria of assessment of innovation projects so that the most innovative projects (including the high-risk projects), as well as the projects that bring most benefits for the economy are actually implemented.
- Overly complex procedures and bureaucracy. There is no mechanism that would encourage the animators of the economic life to become more open to new ideas.
- In the opinion of entrepreneurs authorities do not integrate local society to stimulate innovation and do not create good conditions for the development of entrepreneurship. Ongoing efforts are scattered. There is a lack of cooperation on the principles of partnership.
- The authorities, especially municipalities, are not commonly used modern management system – both in terms of organization and information technology.
- Procedures related to public procurement law often make it difficult to choose the best experts and partners for the implementation of joint projects by local authorities.

Among the positive signals one can indicate a growing awareness, especially of the highest authorities in the region, of the importance of entrepreneurship and innovation. Some communes perform active actions aiming at the provision of sites and services for the investment areas, maintenance of commercial places such as markets, lowering property taxes. Some successes may be recorded by the self-government in the field of national and international cooperation, among others thanks to participation in INTREGRISNET, INTERREG projects, signing of cooperation agreements, e.g. in the scope of biotechnology.

1.3. Key conclusions of assessing the situation regarding innovation funding

Capital is an essential element in the development of innovative activities. Lack of funding opportunities for innovation by firms may be one of the major problems in the economic development of the region. In the case of innovation, an equally important issue, that could be a major obstacle, is the issue of taking risks, and the use of external sources for financing innovative activities. Currently, most of the companies fund innovation activities from their own resources. External financing methods are gradually becoming more popular. In the years 2006-2008, in the funding structure, own funds accounted for 75% of all sources used. Thus, there was a five percent decrease in the use of this source compared to the years 2004-2006, while a simultaneous increase occurred in the use of external funds. In addition, significant differences in this regard can also be seen between the entities in the public and private sector. Namely, the public companies engage their own funds to finance innovation activity to a much lesser extent, compared to private companies - respectively 47% and 83%.[35]

35 Innowacyjność 2010 r. PARP, 2010

The lodzkie region is among the four regions where the companies are characterised by using little of their own funds in the financing of innovation activities. This data demonstrates how important the external sources of funding are for the development of entrepreneurship and innovation in the lodzkie region.

Among the external sources of funding available to the parties from the region are:

- The Regional Operational Programme;
- The Human Capital Operational Programme;
- The Innovative Economy Operational Programme;
- The Operational Programme Infrastructure and Environment (OPIE);
- Rural Development Programme;
- Voucher for innovation;
- Loan for innovation;
- Programmess of the Ministry of Science and Higher Education and its agencies: the National Research and Development Centre and the National Centre for Science;
- Others.

Funds from the ROP were the most widely used source of funding. The most active in the absorption of these funds were Lodz, Poddębice county, Bełchatów county, Tomaszów county, Kutno county, Zgierz county and Sieradz county. Most popular is Priority Axis III - Economy, Innovation, Entrepreneurship, which is the main instrument in the framework of ROP in the development of regional innovation and entities operating in the lodzkie region (the value of the allocation of funds amounted to PLN 1,18 milliard).[36]

The value of the allocation for the regional POKL component in the lodzkie region is 2,25 milliard PLN. So far 2760 contracts were signed for a total value of PLN 1,94 milliard. Within the framework of the regional Component POKL, Measure 8.2 has been particularly important in the context of development of the enterprises' innovation – Knowledge transfer. Within the framework of this measure, 230 applications were submitted in the region, from which support within the framework of this measure was provided to 46 projects for a total amount of PLN 60 million (over 95% allocations).

The institutions of the lodzkie region are responsible for 3,9% of all contracts signed under the POIG. The value of these projects is also 3,76% of the total value of all the projects that received funding.[37] Thus, the Lodzkie Region ranks 9th in terms of the number of signed contracts and 8th in terms of the total value of the projects. A detailed analysis of the implementation of the Operational Programme Innovative Economy shows that at the end of December 2012, institutions operating in the region of Lodz signed 546 contracts with a total value of more than 2,4 milliard PLN. Entities from these areas: the city of Lodz, Zgierz county, Kutno county, followed by the Bechatów county, Wielun county or Skierniewice county, are the most active in terms of absorption of POIG funds. Within the POIG, entrepreneurs quite often asked for technology credit (the amount of the grant awarded is nearly PLN 82 million, which is 11% of the allocation used so far), and measures 4.1 and 4.2. In the case of measure 4.2 - Stimulating R&D activities of enterprises and support for industrial design, which supports both the development of research and development companies, as well as the development of industrial and utility models and their implementation for production, 21 projects received funding in the lodzkie region, amounting to nearly over PLN 90 million; while in the case of measure 4.1 - Support and implementation of the results of R&D aid has been granted to 21 projects, with a total value of over PLN 311 million (EU funding accounts

36 Study on the basis of: Informacje nt. wdrażania RPO WŁ 2007-2013 według stanu na 1 listopada 2012

37 Own work based on Lista beneficjentów Programu Innowacyjna Gospodarka – stan na 31 grudnia 2012

for about 43% of this amount). Measure 4.5, regarding the support investments of high importance for the economy, has the smallest interest within Priority 4. Funding can be granted to both large innovative projects (with eligible expenditure exceeding PLN 160 million and assuming the creation of at least 150 new jobs), as well as projects in the field of the modern services sector, such as the creation or development of shared service centres, IT centres and R&D centres. Only three beneficiaries of this measure operate in the lodzkie region.

Mainly universities in Lodz benefited from The Operational Programme Infrastructure and Environment (POIŚ). 15 priorities are implemented within the framework of the programme, the most important of which, in terms of funding of innovation seems to be Priority XIII – **Infrastructure of tertiary education**. Its main task, among others, is to increase the quality of education through the use of information and communication technologies. Since the start of the programme to date, under this Priority, 5 projects with a total value of PLN 285 million were supported in the Lodzkie Region, of which EU funding amounted to PLN 239 million. Programme beneficiaries include the Lodz University of Technology, University of Lodz and the Medical University of Lodz. Among other financial support programmes were the Rural Development Programme, Voucher for innovation, Loan for innovation, as well as the programmes of the Ministry of Science and Higher Education and its agencies: the National Research and Development Centre and the National Centre for Science (the aim of the programmes created by these institutions is to support research projects in the early stages of innovation development, such as basic and applied research, as well as implementation). In the current programme period at the international level, there are many programmes supporting innovation activities of companies. They include:

- 7th Framework Programme;
- Polish-Swiss Cooperation Programme;
- Framework Programme for Competitiveness and Innovation.

There are also repayable financial instruments offered in the region, such as JEREMIE (among others, by Lodz Regional Development Agency S.A., Polish Foundation of Entrepreneurship, but also by FM Bank, ESBank Bank Spółdzielczy and others available through the Lodz Regional Development Agency S.A.), the Credit Guarantee Fund, as well as commercial banks.

1.3.1. Problems in financing innovative activity

As a part of the project, barriers existing in the lodzkie region in financing innovation have been identified. The barriers are divided into general, relating to the financing of innovation, and the barriers related to financing in the form of grants, equity investments and debt financing. The main groups of barriers are presented in the table below.

Table 5. Barriers in the financing of innovation

General	Grants	Capital investments	Debt financing
Low credit worthiness of a significant number of companies The mentality of entrepreneurs, who prefer to finance the development from their own resources Lack of continuity of funding for projects, i.e. from basic research to implementation Mismatch of instruments to the needs of customers at different stages of research No possibility of combining the EU funds from various sources in the current programme period of programming for the same purpose Lack of awareness among entrepreneurs about where they can find information on sources of financing for innovative activities Limited financial support for private universities (no statutory funding) and private R&D units	Restrictive conditions of financing from EU funds A complicated in terms of content and formality process of applying for EU funds Long time between drawing up a proposal for funding, and the moment of starting the project Limited possibility to modify a project in progress Making changes to the rules during the recruitment of projects (hindering planning and thorough preparation of the project) There are no uniform rules regarding the development of criteria for the selection of projects, as well as a very large number of criteria, making it difficult and discouraging the beneficiary from submitting an application	Uncertainty of entrepreneurs regarding the intentions of new shareholders and the associated fear of losing control over their company Venture capital funds preferring companies established on the market	Banks not treating the SME sector as a priority, and a very careful operation of loan funds Banks perceiving the Polish SME sector as highly risky The need for a mortgage security Banks have no individual approach to businesses applying for a loan and they disregard the specificity of (innovative) activities Banks treat persons engaged in self-employment as natural persons. No preferential treatment for entrepreneurs conducting one-person businesses

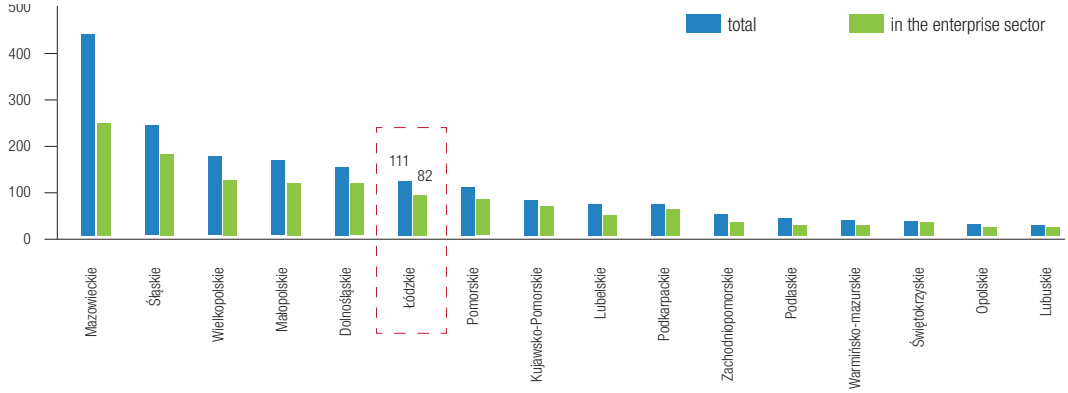
Source: Based on interviews with entrepreneurs as well as analyses of press articles and literature on the subject.

In the context of the identified barriers, the key is to take action to overcome as many of them as possible, and creating an entrepreneur-friendly system, allowing them to develop innovative activities, hence the economy of the region of Lodz. It should also be noted that the new financial perspective (2014-2020) is planning to introduce a number of changes in the financing of innovative activities, including greater emphasis on the functioning of feedback instruments, or the establishment of a European venture capital fund. For this reason it is very important to take into account in the forthcoming RIS LORIS 2030 funding model all possible support for innovation activities under the new policies of the EU.

1.4. Presentation of the scientific potential of the region

The potential of scientific research of the region consists of the research centres located in the region, universities conducting research, and companies with their own R&D centres. Given the number of scientific research entities operating in the region, one can state that the position of the region in this respect is relatively strong.

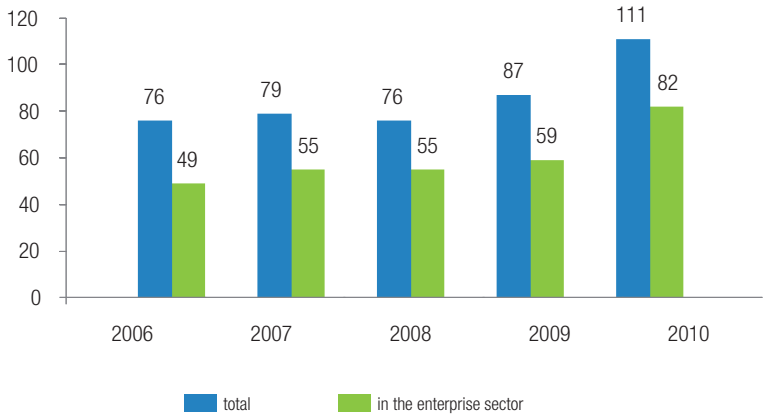
Figure 12. Number of R&D entities in each voivodeship in 2010



Source: GUS, BDL Data.

The number of research and development centres in the Lodzkie Region in the years 2006-2010 was characterized by systematic growth (only in 2008 was there a slight decrease).

Figure 13. Change in the number of research and development entities in the lodzkie region in the years 2006-2010



Source: GUS, BDL Data.

Among the many centres are research institutes (9 of 118 in the country, which represents approximately 7,5%), higher education universities (32) and three of the PAN centres. Most of them are in the high 1st (16 entities) or 2nd category (27 entities), according to the categorisation granted by the Minister of Science and Higher Education (the remaining 3 entities are located primarily in the 3rd category).

Table 6. List of research and development institutes in the lodzkie region receiving statutory grants

Name of institute	Category	Type of institute[39]
Academy of Fine Arts in Lodz - Department of Graphics and Painting	A	SW
PAN Centre of Molecular and Macromolecular Sciences	A	PAN
PAN Institute of Medical Biology	A	PAN
PAN International Institute - European Regional Eco-hydrology Centre	A	PAN
Institute of Polish Mother's Health Centre	A	IB
J. Nofer Institute of Occupational Medicine	A	IB
Institute of Horticulture	A	IB
Lodz University of Technology - Institute of Papermaking and Printing Technology	A	SW
Lodz University of Technology - Faculty of Biotechnology and Food Sciences	A	SW
Lodz University of Technology - Faculty of Civil, Architectural and Environmental Engineering	A	SW
Lodz University of Technology – Faculty of Chemistry	A	SW
PLodz University of Technology - Faculty of Process Engineering and Environmental Protection	A	SW
Lodz University of Technology - Faculty of Mechanical Engineering	A	SW
University of Lodz - Faculty of Physics and Applied Computer Science	A	SW
Medical University of Lodz - Faculty of Biomedical Sciences and Postgraduate Education	A	SW
Medical University of Lodz - Faculty of Health Sciences	A	SW
Grażyna and Kiejstut Bacewicz Academy of Music in Lodz - Department of Composition, Theory of Music, Eurhythmics and Art Education	B	SW
Grażyna and Kiejstut Bacewicz Academy of Music in Lodz - Faculty of Piano, Harpsichord and Organ	B	SW
Academy of Fine Arts in Lodz - Faculty of Textiles and Clothing	B	SW
Film School in Lodz - Faculty of Acting	B	SW
Film School in Lodz - Faculty of Cinematography and Television	B	SW
Lodz University of Technology - Faculty of Technical Physics, and Applied Computer Science and Mathematics	B	SW
Lodz University of Technology - Faculty of Material Technologies and Textile Design	B	SW
University of Lodz - Faculty of Biology and Environmental Protection	B	SW
University of Lodz – Faculty of Chemistry	B	SW
University of Lodz – Faculty of Philology	B	SW
University of Lodz – Faculty of Mathematics and Computer Science	B	SW

38 SW - University, PAN - Polish Academy of Sience, Ib - Research Institute (formerly: research and development entity).

Name of institute	Category	Type of institute[39]
University of Lodz - Faculty of Law and Administration	B	SW
University of Lodz - Faculty of Management	B	SW
Medical University of Lodz - Faculty of Pharmacy	B	SW
Medical University of Lodz - Faculty of Medicine	B	SW
Medical University of Lodz - Faculty of Military Medicine	B	SW
Grażyna and Kiejstut Bacewicz Academy of Music in Lodz – Faculty of Instrumental Studies	B	SW
Academy of Fine Arts in Lodz - Faculty of Visual Education	B	SW
Academy of Fine Arts in Lodz - Faculty of Design and Interior Design	B	SW
Institute of Biopolymers and Chemical Fibres	B	IB
Institute of Leather Industry	B	IB
Institute of Security Technology MORATEX	B	IB
Textile Research Institute	B	IB
Film School in Lodz - Faculty of Film and Television	B	SW
Lodz University of Technology - Faculty of Electrical and Electronic Engineering, Computer Science and Automation	B	SW
University of Lodz - Faculty of of Geographical Sciences	B	SW
Lodz International Studies Academy - Faculty of International Relations and Diplomacy	B	SW
University of Humanities and Economics in Lodz - Faculty of Art	C	SW
University of Humanities and Economics in Lodz - Department of Computer Science, Management and Transportation	C	SW
Centre for Research and Development of Textile Machinery POLMATEX - CENARO	C	IB

Source: Own study based on data from MNiSW.

Research institutes exhibit different research potential (from 1 to 3 scientific category). Almost all of them are located in Lodz (apart from the Institute of Horticulture from Skierniewice), which confirms the significant concentration of R&D potential in the capital of the region.

Most of the universities conducting research and development activities are also located in Lodz. The largest and most important universities in Lodz are the University of Lodz, Lodz University of Technology, and Medical University of Lodz. The second largest academic centre outside of Lodz are Piotrków Trybunalski and the Skierniewice sub-region. The largest non-public schools are: Masovian Academy of Humanities and Education in Łowicz, Social Academy of Entrepreneurship and Management Sciences in Lodz, University of Humanities and Economics in Lodz, and the University of Trade in Łodź.

Some of these entities received the 2010 award of the Ministry of Science and Higher Education for the best research entities. These are:

- Faculty of Chemistry, Faculty of Mechanical Engineering, Faculty of Engineering, Architecture

and Environmental Engineering, and Faculty of Biotechnology and Food Sciences, Lodz University of Technology;

- PAN Centre of Molecular and Macromolecular Sciences in Lodz;
- Faculty of Economics and Sociology, University of Lodz,
- Institute of Polish Mother's Health Center in Lodz;
- Faculty of Biomedical Sciences and Postgraduate Education, and Faculty of Health Sciences, Medical University of Lodz;
- J. Nofer Institute of Occupational Medicine in Lodz;
- PAN Institute of Medical Biology in Lodz;
- PAN International Institute - European Regional Centre for Ecohydrology in Lodz.

Lodz research centres are distinguished in Poland and are visible to the world due to advanced research in biology, chemistry, physics, polymer technology, biotechnology, and mechatronics. The Lodz University of Technology has significant achievements in the field of materials technology.

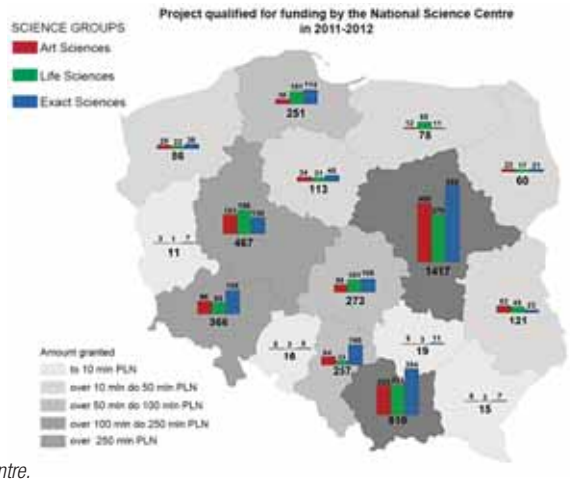
In 2011-2012, Lodz research and development centres entered competitions announced by the National Science Centre thus obtaining numerous grants for scientific research. In the Lodzkie Region, a total of 273 projects qualified for implementation (5th place nationwide). The centres with the greatest number of grants are listed below.

Table 7. List of entities which were granted funding by the National Science Centre by number of projects qualified for funding in the years 2011-2012

Place among other applicants in terms of the number of grants assigned	Name of the research entity / applicant	Number of projects	Amount assigned
7	University of Lodz	109	25 152 286 PLN
13	Lodz University of Technology	72	29 343 874 PLN
16	Medical University	51	23 375 887 PLN
38	PAN Centre of Molecular and Macromolecular Sciences	26	13 767 909 PLN

Source: National Science Centre: http://www.ncn.gov.pl/sites/default/files/pliki/statystyki/mapa-zakwalifikowane-2011-2012.jpg

Figure 14. Projects qualified for funding by the National Science Centre in 2011 and 2012



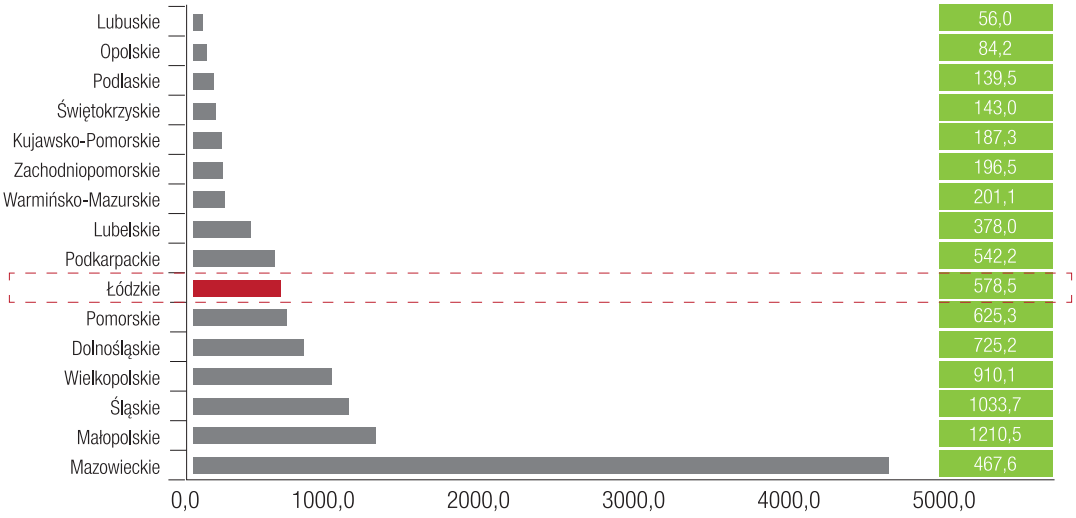
Source: National Science Centre.

Involvement of research and development centres in international research is still too low. Although the presence of Polish research groups in projects implemented e.g. from the 7th Framework Programme is greater every year, accomplishments of Polish researchers in comparison with other countries are far from satisfactory. Poland's success index value, taking into account the participation of Polish teams in research, number of projects and the level of funding, places Poland 21st among EU countries, while the success index for coordination puts Poland as far as 23rd among European countries participating in the programme.[39] Analyses carried out after 355 competitions show that of 8371 submitted applications for participation in the programme, applications from the lodzkie region constituted approx. 6% (527 applications), where ultimately 81 projects were funded. Among 1880 project applications, in which Polish entities acted as coordinators, there were 118 projects of entities from the lodzkie region. Poland received funding for 184 projects, including 9 projects coordinated by entities from the lodzkie region (4,8%).[40]

1.4.1. Expenditures for research and development

Expenditures for research and development in 2011 in Poland amounted to PLN 11 686,7 billion and, in comparison with 2010, increased by 12,2%. In 2011, gross expenditure for R&D in the lodzkie region (GERD) amounted to PLN 578,5 billion, which placed the voivodeship 7th in the ranking of voivodeships in terms of amount of the above-mentioned expenditures.

Figure 15. R&D expenditures in 2011 by voivodeship in billion PLN



Source: Own study based on GUS, BDI data, retrieved on 22.01.2012

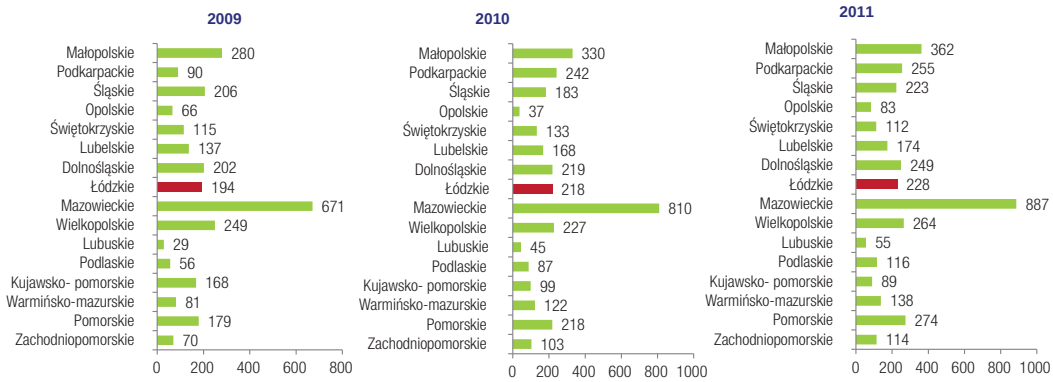
Gross expenditures for R&D in the lodzkie region per 1 inhabitant increased in the years 2009-2011 reaching values slightly higher than the national average.

For several years now, expenditures are growing in such fields as environmental, engineering and technical sciences as well as medical and health sciences, but the share of expenditures for engineering and technical sciences has been decreasing in the lodzkie region in relation to all the expenditures invested in this field in the country.

39 Udział Polski w 7 Programie Ramowym. Statystyki po 337 zakończonych konkursach, National Contact Point for EU Research Programmes, PAN Institute for Primary Technological Problems, October/November 2012

40 Based on information provided by the National Contact Point, state as of 06.02.2013

Figure 16. GERD per 1 inhabitant in billion PLN in 2009-2011



Source: Own study based on GUS, BDL data retrieved on from 22.01.2013

In 2010, almost 50% (PLN 218,7 billion) of funds have been allocated to basic research, i.e. experimental or theoretical work undertaken primarily to acquire or improve knowledge of the causes of the phenomena and facts, actually not directed to achieve specific practical applications. 30% of funds have been spent on research and development, and only 20% on applied research. Voivodeships, where in 2010 expenditure on R&D was equal or lower, such as Silesia and Lower Silesia, have made many more applications of inventions and utility models (respectively 707 and 410), but in the above voivodeships almost 50% of expenditures were allocated to development. Above voivodeships were ranked higher in European regional innovation scoreboard.[41]

1.4.2. The scientific staff of research and development centres

The number of researchers in 2011, expressed in full job time equivalents, amounted to 4 712 which is 5% more than in 2010. The percentage of employees in R&D in relation to total employment in the lodzkie region amounted to about 0,62%. In companies, the equivalent amounted to 765, while in the tertiary education sector 2 791 (no data about the number of R&D researchers in the government and non-profit organizations sector). Technicians and other personnel in the lodzkie region accounted for only 8% (958 persons per 7 858 employed in total).

Table 8. The number of employees (EPC) in the R&D sector in the years 2009 – 2011

	2009		2010		2011	
	Poland	Lodzkie Region	Poland	Lodzkie Region	Poland	Lodzkie Region
The enterprise sector	13 692,9	542,8	18 424,3	631,8	19 529,8	765,3
Government sector + nonprofit institutions	18 429,4	880,0	20 180,2	935,0	bd	bd
Tertiary education sector	41 439,6	3 052,4	43 110,5	2 924,0	bd	2 790,5
Total number of employed in R&D	73 580,7	4 477,2	81 824,5	4 490,8	85 218,7	4 711,6

Source: GUS, BDL, retrieved on 10.11.2012

41 Nauka i technika w 2010 r. GUS, 2012.

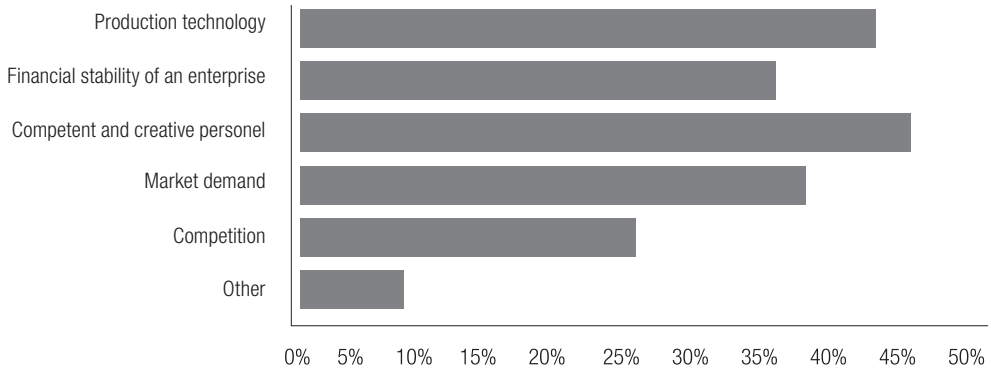
In the tertiary education sector, the academic staff was concentrated primarily in the universities, then technical, medical, and economic universities.

As regards employment in specific areas, most employees accounted for natural sciences (1 135,3) and technical (1 094,7), and then medical (829,4).[42]

1.5. Analysis of the needs of innovative enterprises in the lodzkie region

According to the entrepreneurs participating in the questionnaire survey realized as part of the works on the Strategy, the greatest impact on the innovativeness of enterprises is created by competent and creative personnel, modern production technologies, market demand for innovative products and the company's financial stability.

Figure 17. Factors which, according to entrepreneurs, have the greatest impact on innovativeness



Source: Own study based on questionnaire survey results conducted among 250 entrepreneurs of the lodzkie region.

Representatives of the surveyed enterprises assessed the scientific potential of the lodzkie region as sufficient in the context of functioning of an innovative enterprise. Similarly, positive assessment was given to human capital resources (74%), technological (58%) and business (48%) resources. However, respondents negatively assessed the current situation in the voivodeship both in terms of the level of adjustment of changes in the education system to the needs of the economy (54%), as well as the availability and mobility of highly qualified employees (49%) and access to information about the conduct of innovative activities (45%). Nearly half of the surveyed assessed availability of financial funds supporting development of innovation as insufficient (44%). 38% of the respondents assessed poorly also the existing conditions for cooperation with universities and research centres, as well as organization of technology transfer in the region. It should also be noted that a vast majority of surveyed entities did not have, within their structure, a cell responsible for R&D operations (74% of entities) or a dedicated position for development (70% of entities). The vast majority of surveyed enterprises did not employ or permanently cooperate with researchers. The main reason stated for lacking an establishment of this kind of cooperation was no financial means (53%), as well as insufficient availability of information about the offer of research entities (48%). Nor did respondents see measurable benefits which would result from cooperation of the enterprise with science entities (42%). The imitative nature of innovative Lodz enterprises is demonstrated by the fact that most respondents admitted not having patents, trademarks or licenses (79%, 61% and 65% respectively), while the most cost-effective way of acquiring technologies was indicated to be the purchase of a ready machine / production line. At the same time, 51% of respondents declared their will to conduct development research in the future.

42 In full time equivalents.

The motive behind the development of new technologies, in companies undertaking the survey, was primarily the intention to reduce production costs of current products / rendered services, as well as introduction into the market of new products / services (48% and 50% respectively). The factor, which might in the future encourage participating entities to undertake R&D operations and to develop new technologies, is grants (88% of respondents). Among the technologies, which might affect modernization of enterprises to the greatest extent, the following were indicated:

- information technologies, data processing,
- technologies allowing to process plastics and plastic components,
- technologies used in the production of subassemblies for the manufacture of machinery / mechanics / new machinery solutions,
- new technologies in the construction industry,
- nanotechnologies,
- energy technologies and those allowing to achieve energy cost-efficiency,
- technologies for ceramic products,
- technologies with applications in production of food and highly processed food.

The analysis of the needs of innovative enterprises shows that these needs vary depending on whether the companies are from the high, medium or low technology sector. In the high technology sector, the diffusion of innovation and the absorption of foreign national innovation - raw materials, materials and services - have the greatest impact on the growth of productivity of factors of production. For companies in the medium technology sector, the average increase in productivity of factors of production is evident thanks to the diffusion of innovations from abroad. The increase of spending on R&D and the influx of foreign investment is also extremely important. In the case of the low technology sector, the growth in total productivity was mostly due to the inflow of capital from abroad, national innovation diffusion by the flow of raw materials and materials.[43] Keep in mind that the effects of investment in innovation are not visible immediately. The first effects are noticeable in the period of 1-3 years. A noticeable increase of the level of innovation in the Lodzkie Region requires the implementation of each type of innovation, i.e. product, process, organisational and marketing. Innovations should include both the introduction of modern methods of business management, proper preparation of personnel to act in creative and innovative ways, e.g. through appropriate incentive systems, as well as the implementation of modern methods of production and the provision of services taking into account factors such as material consumption, energy consumption, environmental friendliness, and meeting the highest customer standards. A permanent part of the company's innovative change is transformation. An innovative company must be able and willing to constantly search for and use in practice the research results, new concepts, ideas and inventions. An innovative company develops, absorbs and uses the new products or services, and is prepared to continually adapt to changes in the environment. Business innovation is, therefore, influenced by many factors, both external and internal. The foreign investments are not only responsible for the creation of new jobs, but also for the implementation of innovative solutions and creating more on-site R&D centres on the local market. It is also necessary to use the effects of domestic innovation, their effective diffusion both between enterprises and scientific research centres. A company that aspires to be innovative must assume its new development strategy, so that it is open to non-standard ways of thinking and willing to take higher risks and consequences of possible failures. People are needed to implement the strategy - the company staff is not only well trained and technically qualified, but also capable of continuous learning.

43 Innowacje a wzrost efektywności sektorów polskiej gospodarki, Iwona Świeczewska in: Raport o innowacyjności gospodarki Polski w 2010 r. edited by Tadeusz Baczko, PAN, Warsaw, 2011

The concentration of innovation development around large companies is also a typical trait of the lodzkie region. This does not mean that raising competitiveness on the market does not matter for medium, small and micro enterprises. It is rather the result of both some cultural and awareness conditions, as well as limited financial resources, as demonstrated by the results of research conducted in the region. The key to the development of such enterprises in the region is to establish cooperation with the sphere of science and the business environment institutions, for innovation and transfer of knowledge and new technologies, or raising funds to create proprietary R&D departments.

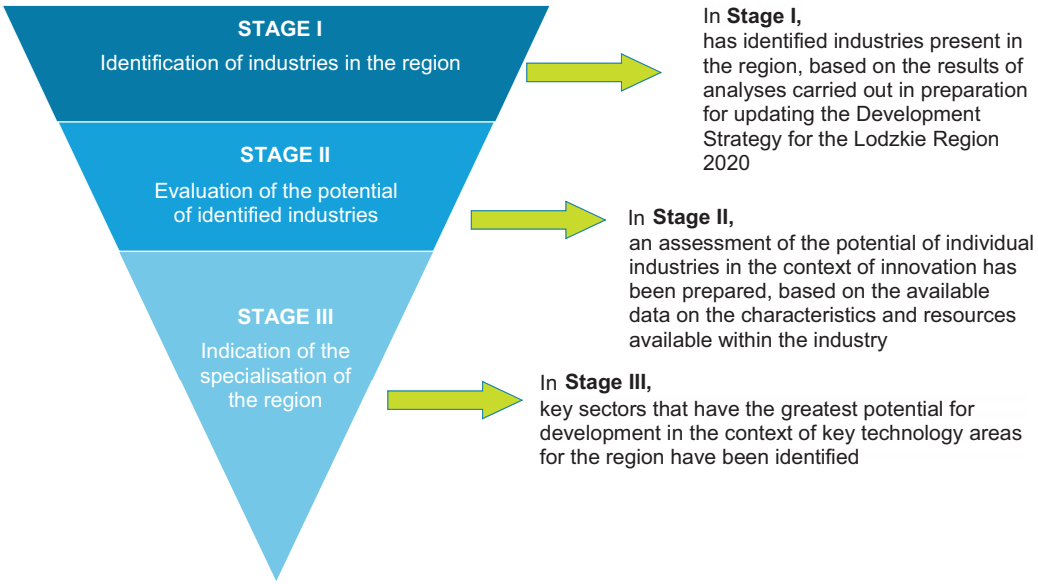
The above interaction and complementarity between internal and external factors in the development of innovation means that one of the priority elements of innovation policy in the region should be affecting the improvement of the innovation environment in which businesses operate, i.e. on one hand, it should encourage the creation of innovative companies, and on the other - to stimulate development of the Regional Innovation System so as to increase the absorption capacity of non-innovative firms.

1.6. Identification of the directions of innovative development of the region, including the leading sectors and technologies

1.6.1. Identification of key industries in the region

The process of identification of key industries in order to identify areas of expertise of the lodzkie region ran in three main stages, presented in the following figure.

Figure 18. Stages of identification of key industries regarding regional specialisation



Source: Own study.

STAGE I. Identification of industries in the lodzkie region

Identification of key industries within the specialisation has been based on statistical analysis of the different areas of the region's economy, including the assessment of potential compared to the rest of the country. In addition, previous studies have analyzed the work done on the Regional Innovation Strategy

for the Lodzkie Region, in particular, the establishments developed as a part of these projects have been analysed:

- RIS LORIS 2005 - 2013 – Regional Innovation Strategy for the Lodzkie Region;
- RIS LORIS PLUS – Regional Innovation Strategy for the Lodzkie Region;
- LORIS TEX – Transformation of the textile and clothing industry from labour-intensive into science-intensive.

In addition, the results of the work on updating the Development Strategy for the Lodzkie Region 2020 have been used in the analysis, as well as the results of a series of works in the area of technological foresights for Poland, the lodzkie region, and selected industries and technologies, in particular:

- LORIS WIZJA – Regional Technological Foresight;
- Technological foresight of the Polish industry – InSight2030;
- Modern Technologies for Textiles. A chance for Poland;
- Technological foresight for polymer materials;
- Food and Nutrition in the XXI Century – a vision of the development of the Polish food sector.

Data on the use of aid funds and the results of field studies carried out in the framework of this project have also been an important source of knowledge about the situation in the voivodeship, in particular:

- CATI – computer-assisted telephone interviews, addressed to economic entities;
- CAWI – computer-assisted interview, addressed to scientific departments and other institutions;
- IDI – individual in-depth interviews.

In addition, the results of the discussions and conclusions of the expert panel on the mapping of technology and the prioritisation of critical technologies, which took place on the 16th of November 2012, and the meeting of the RIS Steering Committee, which took place on the 29th of November 2012. The assessment of other industries also made use of other findings and information from companies, research entities and universities. Links to source materials have been directly identified in the report. As a result of the analysis, the following key industries of the lodzkie region have been determined:

- Textile industry and clothing industry;
- Production of building materials, including ceramics, construction chemicals, building woodwork;
- Manufacture of household appliances;
- SSC, BPO/ITO, R & D (Shared Business Centres, Business Process Outsourcing Centres/Information Technology Outsourcing Centres, Research & Development Centres);
- Conventional energy (production, processing and transmission of energy) and generation of energy from renewable sources;
- Logistics;
- Agriculture and food processing industry;
- Furniture industry;
- Electromechanical and mechanical industry;
- Medicine, pharmacy, cosmetics, health protection services;
- Creative industries;
- Information technology and telecommunications;
- Environmental services.

STAGE II. Evaluation of the potential of the industries in the lodzkie region

In stage II, an assessment of the potential of industries present in the lodzkie region, including their innovative potential, has been assessed, as shown in the following table. Assessment of the potential of various sectors has been conducted in areas including:

- Potential of companies – the number of companies, employment;
- Research possibilities – the scientific and research potential, scientific research institutes, institutes of the Polish Academy of Sciences;
- Educational opportunities at the tertiary education level – faculties;
- Educational opportunities at the vocational level – high schools;
- Potential of the cooperation partners – partners, product, subsuppliers, value chain;
- The internal market – is there a demand in the country/region.

Based on the above criteria, industries with the greatest potential for development in the region have been identified. The possibilities of the voivodeship to compete with other voivodeships in selected areas of specialisation have also been taken into account.

As a result of the evaluation, which has been confirmed by the experts at the meetings of the expert panel, **industries with the greatest potential for growth in the lodzkie region** have been selected. They include:[44]

- **Modern textile and fashion industry (including design);**
- **Advanced building materials;**
- **Medicine, pharmacy, cosmetics;**
- **Energy, including generation of energy from renewable sources;**
- **Innovative agriculture and food processing;**
- **IT and telecommunications.**

STAGE III. Indication of regional specialisation

The next step in the identification of the specialisation of the Lodzkie Region was a relation of the potential of the identified industries to the technological potential of the voivodeship. A detailed description of the potential of technology areas identified below is presented in subsection *1.6.2 Identification of key technological areas in the region.*

The aim of the choice of regional specialisation in respect of the areas of technology was to identify the potential to achieve synergy between the areas of specialisation. As a result of the evaluation, 6 of the regional specialisations in the area of industries and 4 areas of technology have finally been selected, as shown in the following table.

44 The detailed description of the potential of industries in the Lodzkie Region was presented in the report titled "Technology mapping and prioritization of critical technologies", Łódź, 2012

Table 9. Assessment of technological potential for industries selected in terms of specialisation

		Voivodeship's technological potential				
		Biotechnologies	Nanotechnologies and functional materials	Mechatronics	Information and communication technologies	Total
Industries within regional specialisation of the region	Advanced building materials	V	V	V	V	4
	Energy (including RES)	V	V	V	V	4
	Medicine, pharmacy, cosmetics	V	V	V	V	4
	Innovative agriculture and food processing	V	V	V	V	4
	Modern textile and fashion industry	V	V	V	V	4
	IT and telecommunications	V	V	V	V	4
	Total	6	6	6	6	

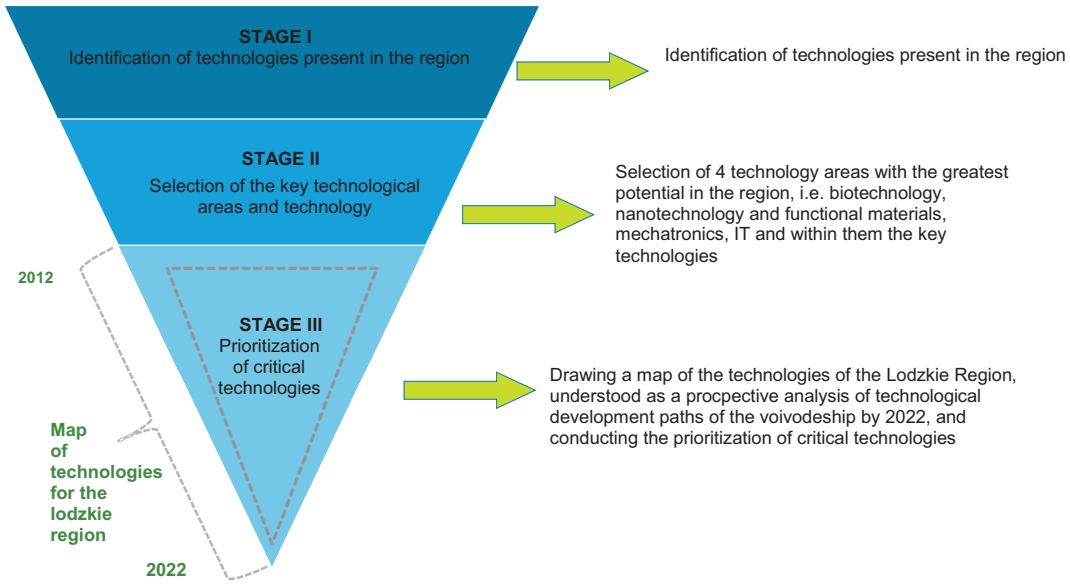
Source: Own study.

Entities operating in the areas of regional specialisation will be able to count on support from EU funds under the future financial perspective (2014-2020) including from the Regional Operational Programme for the years 2014-2020, in particular for implementation of projects regarding issues which are at the interface between the indicated industries and technologies. A particular innovation potential of the industries and technologies indicated above results from the simultaneous presence of research opportunities, the opportunities of tertiary education and vocational education, the existence of an educated internal market, the potential of companies and the potential of partners to cooperate, in the region. In the future, the emergence of new industries and technologies that can extend the above directory is also possible. It should be subject to regular analysis and technology mapping in the coming years as part of the monitoring and evaluation of the RIS LORIS 2030.

1.6.2. Identification of key areas of technology in the region

The aim of the identification key areas of technology that should be developed in the area of specialisation indicated for the lodzkie region was to ensure synergy in the area of ongoing activities. The approach used to select the key technologies is presented in the following figure.

Figure 19. Approach to the selection and prioritisation of key technologies



Source: Own study.

STAGE I. Identification of technologies present in the region

Identification of the technologies present in the region has been made based on the results of the analysis of the research potential of the region and taking into account the industries identified as key to further economic and innovative development of the region. In addition, previous studies, being a part of the works conducted in the previous editions of the Regional Innovation Strategy for the Lodzkie Region – "LORIS 2030", have been analysed, in particular the studies prepared for the projects:

- RIS LORIS 2005-2013 – Lodz Regional Innovation Strategy,
- RIS LORIS PLUS – Regional Innovation Strategy for the Lodzkie Region,
- LORIS TEX – Transformation of the textile and clothing industry from labour-intensive into science-intensive,
- Analysis of the possibility of the development of regional specialisation, including the innovative potential of the research and development sphere, Expertise prepared for the Office of Regional Planning in Lodz, Anna Rogut, Bogdan Piasecki, Lodz, December 2011.

In addition, the results of work on updating The Development Strategy for the Lodzkie Region 2020 have been used. Pre-existing data analysis results have been confirmed during field studies: CATI, CAWI and IDI, conducted with entrepreneurs and representatives of the sphere of science.

STAGE II. Selection of the key technological areas and technology

Key technology areas and technologies have been selected among the identified technologies. The initial choice of technology, due to the limited amount of time to conduct a detailed study in the area of technological analysis of the region, has been supported by the results of the foresight research, previously carried out in Poland and the region:

- LORIS WIZJA – Regional Technological Foresight;
- Technological foresight of the Polish industry – InSight2030;
- Modern Technologies for Textiles. A chance for Poland;
- Technological foresight for polymer materials;
- Food and Nutrition in the XXI Century – a vision of the development of the Polish food sector.

These studies have identified hundreds of technologies that should help accelerate the socio-economic development of the country, have a significant impact on the competitiveness of Polish industry, and thanks to which Poland could be commercially successful on the global market. Indication of the technology has been made taking into consideration aspects like:

- the need to increase the competitiveness of the economy, which indeed determines the ability to cope with all the other challenges,
- socio-economic aspects of the economic development, including, most of all, the need to provide jobs, in particular those that require high qualifications, for future generations, and the problems associated with the aging of society, including health care,
- optimal and sustainable use of natural resources, including minerals,
- rationalisation of energy consumption, the need to increase the share of renewable energy the energy balance and ensure greater energy security,
- ensuring civil security, economic and military circulation.

During the previous research, mentioned above, the collected materials, expertise and opinions have been tested using the Delphi method and subjected to panel discussions for the possible time horizon, the range of potential industrial applications, consequences and social impact. This process has run with the inclusion of the following key elements:

- review of existing foresight studies in the analysed areas of technology,
- analysis of the available maps of technological development,
- analysis of the trends and dynamics of technology development and innovation in the world and the country,
- analysis of the development of the global market and anticipated changes in its technological structure,
- study of the needs and views of interested scientific, industrial and social groups,
- testing of system conditions, including the legal environment of the research and development works and innovative financial and organisational projects,
- analysis of the potential risks, environmental and ethical hazards.

As a result of research conducted in such a way, six groups of technologies, whose development is essential for the whole processing industry and the condition of its modernity and competitiveness have been identified. These are:

- Advanced manufacturing systems;
- Information and telecommunication technologies;
- Industrial biotechnology;
- Nanotechnology;
- Microelectronics;

- Photonic technologies.[45]

However, in the study of the National Foresight Programme Poland 2020, a list of recommended technologies has been made, indicating that due to the already accumulated scientific research potential and the opportunity to create intellectual capital, they provide a chance of implementations resulting in the development of competitive or niche branches of the economy. They are:

- Unique technological equipment and apparatus for testing and measuring technology for the next generation of advanced technology;
- A new generation of structural and functional materials and surface engineering technology, including nanomaterials and nanotechnologies;
- Energy-efficient construction technologies, systems and materials for the use of „smart" houses, public infrastructure, industrial buildings including recycling and environmental protection;
- Polygenerational, environmentally safe technologies, technologies of integrated production of energy and technological products;
- Technologies of renewable and alternative energy sources, allowing the production of electricity and heat in distributed systems;
- Nuclear energy technologies and their hybridisation with advanced carbon techniques and solutions that use renewable energy sources;
- Advanced methods and IT technologies that shape the competitiveness of the economy, including expert equipment control systems, industrial processes, communication networks and monitoring of the environment.

In view of the above indications, resulting from the foresight research, and the essay titled "Analiza możliwości rozwoju specjalizacji regionalnych z uwzględnieniem innowacyjnego potencjału sfery badawczo-rozwojowej", Anna Rogut, Bogdan Piasecki, Lodz 2011, and identified areas of expertise in the region, a set of industry-specific additional criteria has been prepared. They have been used to identify key areas of technological development of the region and the technology present. A set of additional criteria is listed below. These are:

- Impact of a given technology on the development of an industry being a regional specialisation.
- The possibility of using the technology in a number of industries that are regional specialisations of the lodzkie region.
- Phase of the life cycle of a technology.
- Phase of the life cycle of the products, in which the technology will be used.
- Level of technology readiness.
- The potential for the development of a given technology in the region. In particular, the assessment covered:
    - the staff possibilities, including the knowledge and achievements of people working on the development of a given technology,
    - level of the owned research equipment, used for research on the development of the technology,

45 FORESIGHT TECHNOLOGICZNY PRZEMYSŁU Insight 2030, carried out by a consortium of The Polish Chamber of Commerce for High Technology, Institute of Fundamental Technological Research Polish Academy of Sciences, CENTRAL MINING INSTITUTE commissioned by the Ministry of Economy, Warsaw 2011 r. The choice of 6 technology areas indicated in the document is in line with economic and scientific policy of European Union. „In 2009 European Union has identified those technologies as very important to the European economy because of their impact on innovation and the competitiveness of the industry describing them as key enabling technologies. In the European Commission rerpot "European Competitiveness Report 2010 – Putting Competitiveness and Sustainability at Front Stage. CON(2010) 614) „it is stated that the above-mentioned technologies play a crucial role in the development of the industrial and technological base of the European economy".

- programmes funded by entities located in the lodzkie region, and programmes financed from external sources, aimed at developing the given technology.

On the basis of such criteria, **key areas of technology** have been identified, which, due to the potential existing in the region, have a chance to grow and support the economic growth of the region. The areas of technology of the lodzkie region include:

- **Biotechnology;**
- **Nanotechnology and functional materials;**
- **Mechatronics;**
- **Information and communication technologies.**

The choice of these technology areas has been confirmed by experts from different backgrounds in the region, including academics and business, during the panel of experts organised for this purpose. Identified, in the above-mentioned technological areas were key technologies for the development of the region. Presented below is a diagram presenting a list of key technologies for regional development and their relation to the identified technological areas.

Table 10. The relationship between technologies 2012 and identified areas of technology

		Technological areas			
		Biotechnology	Nanotechnology and functional materials	Mechatronics	Information and communication technologies
Technologies 2012	Biochemistry	■			
	Pharmaceutical technologies	■	■		
	Medical biotechnology	■			■
	Clinical medicine technologies	■			■
	Industrial biotechnology	■			■
	Molecular biotechnology	■			■
	Material technologies		■		
	Nanomaterials		■		■
	Chemistry		■		
	Textile technologies		■	■	■
	Robotics and automation			■	■
	Computer Science			■	■

Source: Own study.

Also indicated, as part of this stage of identifying key technologies and development on a technological map for the lodzkie region, were key technologies of the future which in 2022 will be characterized by the greatest potential for growth and by the possibility to apply their developed solutions in business practice.

It is believed that the key technologies in the lodzkie region in 2022 will include:

- Biocatalysts;
- New generation biofuels;
- Biomaterials;
- Biometric Technologies;
- Pharmaceutical technologies including bio-synthetic drugs;
- Nanomedicine;
- Structural nanomaterials;
- Nanochemistry (including construction chemicals);
- Sensor technologies;
- MEMS Technologies (including ICT).

STAGE III. Prioritisation of critical technologies

The last step was to prioritise the above-mentioned critical technologies. As a result of the meeting of the expert panel, based on the following criteria:

1. Economic expectations;
2. Strengths and weaknesses of the regional scientific potential;
3. Costs of development and implementation;
4. Economic and social needs;
5. Scientific and technological possibilities;
6. Implementation potential;
7. Time horizon for preparation and implementation;
8. Global impact;
9. Probability of success;
10. Importance/criticality;
11. Size of the market.

The following critical technologies were indicated which will be crucial in the future (a time horizon until the year 2022 was adopted):

- Nanomedicine;
- Biocatalysts;
- A new generation of biofuels;
- Pharmaceutical technologies, including bio-synthetic drugs;
- Nanochemistry (including construction chemistry);
- Biomaterials;
- Biometric technologies;
- Structural nanomaterials;
- Sensor technologies;
- MEMS technologies (Micro Electro-Mechanical Systems);
- and ICT technologies.

Chapter 2

SWOT Analysis

2. SWOT Analysis

The increase in the level of innovation in the region is the main objective of the RIS LORIS 2030 being created. The problem, however, is to identify areas of interventions and tools that will prove most effective in the future, and also they should help achieve the results as soon as possible. Critical assessment of the socio-economic situation of the region, and as a result – SWOT analysis, help to identify these areas and instruments. This analysis uses the results of works realised as a part of a series of tests and analyses, carried out in the following subject areas:

- The model of technology transfer in the region;
- Possibilities of the innovation financing system;
- RIS LORIS 2030 monitoring and evaluation system.

The observations and conclusions of these reports have been included in this study.

The information on the region has been segregated into four groups (four categories of strategic factors):

- S (Strengths) – strengths: everything that is an asset, advantage, benefit of the region, industry;
- W (Weaknesses) – weaknesses: everything that is a weakness, barrier, defect of the region, industry;
- O (Opportunities) – a chance: everything that provides a chance of favourable changes for the analysed region, industry;
- T (Threats) – hazards: everything that jeopardizes the object being analysed, causing the risk of adverse changes.

And then assigned to the right areas:

1. Knowledge-based economy.
2. Science in the service of innovative development.
3. Knowledge-based society.
4. Regional innovation policy.
5. Knowledge-based administration.

Table 11. SWOT Analysis - Strengths, Weaknesses

STRENGTHS	WEAKNESSES
Macroeconomic data and location	
Quite a well-developed region of Poland in terms of economy (6th position in the country in terms of GDP per capita in 2010).	Disproportion of economic development of the region (the concentration of development in Lodz and counties located in the central part of the region and in the Bełchatów county). Losing the socio-economic functions of some of the counties (Tomaszów Mazowiecki, Pabianice, Zgierz, Łask, Zduńska Wola, Wieruszów, Łęczyca, Łowicz, Poddębice, Wieluń). Untapped potential for the development of the region, especially in industry and services.
6% share in the creation of the national GDP (2010). GDP growth dynamics higher than national average.	GDP per capita lower than the national average.

STRENGTHS	WEAKNESSES
Higher, than nationwide, share of industry in the creation of the regional added value (in 2010 28,5%, Poland: 24,7%).	
Good position of large and medium-sized enterprises (in the years 2009-2011 they achieved profits) that allows effective competition on the market.	
Increase of labour productivity in industry (production sold per 1 employee in 2011 was 362,7 thousand PLN - an increase by 12% compared to the previous year).	Industrial output much lower than nationwide average (by approx. 20%).
4th in the country in terms of investment in the industry (2010r. - 9,1%). The increase in industrial output (by 16,4% in 2010).	
The dynamic development of industrial and economic zones (e.g., 190 investors in LSEZ, 12 milliard investment, over 23 thousand new jobs).	
The presence of large companies with substantial innovation resources in the region: patents, certificates, the results of own research.	
Beneficial location in the centre of Poland, especially in terms of the target pattern of motorways and express roads.	
Knowledge - based economy	
The high level of industrialisation and the potential for innovative development for the following industries: textile and clothing, pharmaceutical, medical including spa and cosmetic, advanced materials, energy (conventional, RES, EE), agri-food, information technology, telecommunications, advanced outsourcing services.	Low innovation of industry - obsolete production technologies, very low percentage of industrial enterprises, which made expenditures on innovation activities in the country (9,5% - 2011).
The potential for the development of new technologies: nanotechnology, biotechnology, mechatronics, materials, functional, modern design, information technology (provision of specialised IT services including software design, production of intelligent devices).	Weak participation of medium and high technology industry.
Significant agricultural potential of the areas of intensive horticultural production (fruit growing, vegetable).	
The presence of large companies with substantial innovation resources in the region: patents, certificates, the results of own research.	A significant advantage of SMEs of low innovation potential over large companies. A small number of development centres of large companies from abroad. Too small technology transfer from large investors to the region. A small number of businesses creating and investing in R&D centres with their headquarters in the region.

STRENGTHS	WEAKNESSES
	Low adaptability of companies, who are not willing to take risks. No formal strategy for the development of innovation in companies. A low level of social trust, low cooperative relations of companies.
High entrepreneurship of the inhabitants of the region.	
Relatively large internal market.	No demand on the local market (from the companies, final recipient as well as local government administration) for innovative products.
The high investment attractiveness of the voivodeship.	In terms of attracting investors: the focus on job creation, not requiring (not encouraging) the companies to build research departments at the same time, doing research activities in the region.
The existence of cluster initiatives related to industries recognised as crucial in the region.	A small percentage of companies cooperating within cluster initiatives (0,3% of companies). Lack of qualified permanent networks between entrepreneurs, the sphere of education, local government and business environment institutions.
The existence of institutions supporting the development of innovation: Science and Technology Park, incubators, the Institute for New Technologies, Innovation Centre Accelerator of Technology and Technology Transfer Center located at the University of Lodz, Technology Transfer Center of the Lodz University of Technology, Center for Innovation and Technology Transfer at the Medical University of Lodz.	Large dispersion of business environment institutions in terms of the offer, lack of educated, highly specialized services among others. In the area of technologies transfer, lack of flow of information between business environment institutions. Concentration of BEI in the lodz metropolitan area. Lack of a good financial offer for companies (especially for financing investments of an increased risk).
Increasing expenditure on fixed automation of production processes (automated production lines, robots and industrial manipulators, computers to control and regulate technological processes).	A small number of companies with their own R&D departments within their structures or using commissioned research work. From the perspective of the companies, an unprofitable relation of costs and risk to the offer of R&D (including the high price, the uncertainty of the effect, long time-to-market, concerns about the possibility of actually gaining any tangible results of cooperation, in particular in light of the necessary capital to finance it).
	Businesses' low funds for innovation activities.
	Untapped potential of the proximity of Warsaw (the possibility for synergies in many areas through joint actions).
	Low cooperation of vocational and technical schools with enterprises, and often lack of education majors corresponding to the actual needs of local market companies.

STRENGTHS	WEAKNESSES
Science in the service of innovative development	
The increase in expenditure on R&D in absolute terms.	50% of the resources devoted to basic works. Low share of enterprises in financing of R&D.
The existence of a strong research and development potential of the region (The existence of large scientific and research centres, both in terms of number of entities, number of personnel, as well as the practical orientation of the research sector, relatively high number of patents). Strong scientific centres in Lodz and Skierniewice.	Low level of cooperation between research centres in the region, preventing the implementation of joint projects and strengthening the position of the region compared to the rest of the country in terms of scientific achievements. Poor quality of research infrastructure in many scientific institutions.
Increasing level of employment in R&D compared to other regions and increasing level of employment in R&D activities regarding companies in the region.	
A large supply of qualified personnel. The percentage of the least educated (with primary and secondary education) is lowering. The growing popularity of technical faculties among students. Wide offer of education at the post-middle school level.	A large number of humanities graduates, unprepared for work in the industry. Inadequate curricula (few practical classes, many faculties lack subjects giving basic knowledge of entrepreneurship). Poor state of vocational and technical education. Insufficient cooperation between entrepreneurs and the academia in the field of apprenticeships and traineeships.
A relatively large number of PhD students in areas that can support the development of regional specialisation: medical, technical, chemical.	
	Lack of stable, long-term operational conditions of innovation centres (Dependence on one funding source (EU funds) may transpire to be a significant threat in the event of limiting access thereof and lead to liquidation or significant limitation of the centres' activities).
The transfer of knowledge from universities to business through informal collaboration of scientists with companies (entrepreneurs prefer to conclude a cooperation agreement with an individual researcher over a university as an institution due to the extensive and fossilized structure of the latter).	Lack of orientation of the R&D to the commercialisation of research results and working with entrepreneurs. Passivity of research institutions in developing innovative solutions to offer, the lack of knowledge of commercialisation initiatives on the part of academic institutions. No offer and compatibility of interests of the innovation market participants (No consciousness of the needs of businesses and opportunities for cooperation with research centres, usually resulting from ignorance of their offer by the company or its incompatibility with the real needs of the market).
The growing potential of the regional entities to obtain external support from the EU, stemming from the experience of the previous programme period (all resources have been used) - not only in fulfilling the formal requirements, but also to develop mechanisms for cooperation.	Low use of resources available within the target projects of MNiSW for the science sector's co-operation with the business sector. Insufficient number of large research projects implemented jointly with other regions in Poland, as well as foreign partners.
A large number of patents.	Low productivity of research due to the insufficiently competitive distribution of funding for research.

Knowledge – based society	
The increasing awareness of the use of modern technology, the Internet, etc. among the population of the region.	The difficulties in defining INNOVATION. Identifying innovation only with very sophisticated technical solutions and research. Low level of social capital and passive social attitudes (in terms of social capital the lodzkie region is below the national average. Residents of the region are characterised by a low level of trust in public institutions, political parties and other citizens, as well as low social self-organisation, little willingness to cooperate and little responsibility for the environment).
Growing interest in digital information and on-line services.	Insufficient access to broadband Internet networks and low level of equipment in computer devices in households.
Administration in the service of innovative development	
Increasing awareness of public administration of the importance of innovation and entrepreneurship for the future development of the region.	There are no good mechanisms at national and regional level to support the development of entrepreneurship and innovation.
Preparing the platform of knowledge and technology transfer based on the assumptions of markets of open innovation by the Marshal's Office of the Lodzkie Region, which will significantly support the innovation processes in the region.	Insufficient access to e-services and public administration.
	Difficulty associated with determining criteria allowing to select the most valuable innovative projects.
The relatively high level of use of public funds for the development of innovation by companies.	Overcomplex procedures related to the settlement of projects co-financed from EU funds.
Regional innovation policy	
	Lack of a coherent vision of how innovation policy can translate into socio-economic development, the lack of a functional innovation strategy.
	Lack of an effective and efficient system of innovation support and a monitoring and evaluation system.
	Lack of mechanisms and tools for effective flow of information and knowledge among key actors in the innovation processes.

Table 12. SWOT Analysis – Opportunities, threats

OPPORTUNITIES (internal and external)	THREATS (internal and external)
Macroeconomic data and location	
Increasing the share of the region's GDP in the country's GDP.	
Experience and considerable potential to provide some of the IT services and manufacturing of smart devices corresponding to the expected demand for services of this kind in the future.	Increasing competition from developing countries. Technological advantage of better developed countries.

OPPORTUNITIES (internal and external)	THREATS (internal and external)
The increasing demand for medical services and services related with spending free time.	
The development of a low carbon economy, friendly to the environment.	High social and economic costs associated with the implementation of the EU's CO2 reduction policy.
	Delays in terms of further development of the road, railway and IT infrastructure in the voivodeship.
	Unfavourable demographic changes in the region (such as population ageing, negative birth rate, negative migration balance, as well as increasing structural unemployment.
Knowledge – based economy	
Creation of high quality, modern products and supply of specialized services in industries belonging to smart regional specialisation (key industries: modern textiles and fashion, building materials, energy and renewable energy sources, medicine (including spa), pharmaceuticals, cosmetics, agriculture and food, IT and telecommunications, and new technologies: biotechnology, nanotechnology, mechatronics, modern design) intended for local, national and international markets.	Insufficient support for key industries, the lack of coordinated action from entities involved in the system of regional innovation that may bring about the loss of the chance to turn the region into an innovative basin of modern industry.
Good climate for business development and investment (Lodz Special Economic Zone, cluster initiatives, industrial zones).	Moving production and investment to regions and countries with lower production costs and lower personnel costs.
Development and specialisation of companies in the most innovative sectors of the economy.	
Possibility of selection of leaders within the existing cooperation networks / partnerships / clusters, who will be able to motivate other institutions to continue the operations in progress, coordinate fragmented activities and ideas, and lead partners to new projects (animators of cooperation).	
The acquisition of standards imposed by large corporations, associated with the implementation of innovation activity, continuous improvement and upgrading of products and services by the companies in the SME sector.	
Science in the service of innovative development	
Closer cooperation between science and business through initiatives taken by some universities and centres of technology transfer, such as implementation of joint projects, information exchange platforms (e.g. LabNet).	The outflow of educated people to other cities and abroad.
	Perceptions of other research centers and universities as competitors instead of partners
Changing the rules for the distribution of public funds for science and tertiary education - an increase in competitive and pro-quality funding.	Insufficient public and private spending on research and development. Keeping an unfavourable pattern of expenditure on research and development.

OPPORTUNITIES (internal and external)	THREATS (internal and external)
The participation of scientists from the region in international projects, establishing long lasting relationships with national and international research centres and universities.	
Modifying the curricula by close cooperation of schools and businesses to develop work experience systems.	Too slow adapting of the curricula to the requirements of the economy.
	Conflicts of interest of scientists and entrepreneurs - the entrepreneur is interested in keeping their innovations secret, whereas the scientist is interested in publishing it.
	The change of the categorization of R&D entites performed by Ministry of Science and Higher Education.
Knowledge – based society	
Gradual development of society in the direction of civil society – increase of the sense of responsibility for the region.	Difficulties in overcoming the mental barriers, such as prejudice, lack of confidence.
	The stereotype of the lodzkie region as an industrial and not very modern area, which is dominated by degraded areas.
Administration in the service of innovative development	
	Delays in the development of modern administration.
Increase of the awareness of the need to reduce administrative burdens.	Procedures associated with the public procurement law, hindering selection of the best experts and partners for the implementation of joint undertakings by local government authorities.
Construction of public funding programmes (e.g. RPO) tailored to the identified needs in the area of key industries and the general rise of entrepreneurship and innovation in the region (concentration of support).	Insufficient level of interest in the use of instruments of financial engineering.
	Insufficient activity of local governments in attracting investors, engaging in initiatives implemented in the partnership.
The emphasis on the implementation of policies to encourage innovation on the part of the EU and the available resources from EU funds for innovation.	In the long run - the exhaustion of funds for innovation within the European funds; the need to seek alternative sources of financing.
	The economic downturn resulting in a decrease of interest in the subject of innovation among RIS stakeholders.
	Existence of a number of barriers to innovation development on the national level such as, for instance, the tax barrier.

OPPORTUNITIES (internal and external)	THREATS (internal and external)
Regional innovation policy	
The forthcoming update of the Strategy of the Development of Innovation for the Lodzkie Region – "LORIS 2030" in the region with a detailed plan of action, and monitoring and evaluation system.	Insufficient integration of key stakeholder groups of the Regional Innovation System.
Extension of the functions of the Lodz Knowledge Transfer Platform, which aims to support communication and exchange of knowledge between actors in the Regional Innovation System.	

Based on the strengths and weaknesses and the opportunities and threats identified in the voivodeship, development scenarios and a set of conclusions and recommendations for regional authorities have been prepared, which are presented in the following sections of RIS LORIS 2030.

Chapter 3

Scenarios for development in terms of innovation

Moderate scenario

Optimistic scenario

Pessimistic scenario

HUMAN CAPITAL
NATIONAL COHESION STRATEGY

Lodzkie Region

EUROPEAN UNION
EUROPEAN
SOCIAL FUND

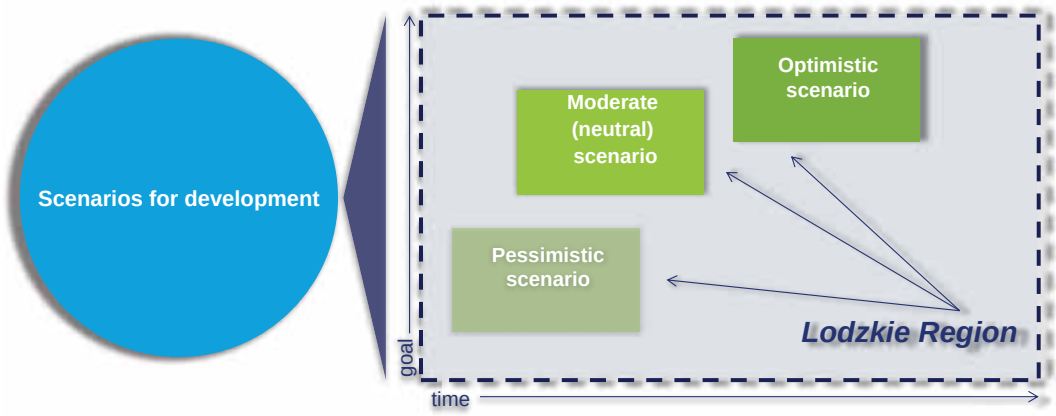
3. Scenarios for development in terms of innovation

Scenarios for development are used in strategic planning to present the possible future, aimed at the selection of the development policy option - its objectives and priorities. The essence of the development scenarios is to show, based on trend analysis and the determination of the position of development, what the image of the region might be in the perspective up to the year 2030.

This chapter will present three scenarios for the development of the lodzkie region in the perspective up to the year 2030:

1. Moderate (neutral) scenario.
2. Optimistic scenario.
3. Pessimistic scenario.

Figure 20. Scenarios for the development of the lodzkie region



Source: Own study.

The baseline scenario is the moderate (neutral) scenario. It is based on trends and strategic challenges set out in the Development Strategy for the Lodzkie Region 2020. It also includes the provisions of the Innovation and Efficiency Economy Strategy for the years 2012-2020 „Dynamic Poland", the strategic document „Poland 2030", and Long-term National Development Strategy. Two other scenarios are an extension of pessimistic and optimistic assumptions from the moderate scenario.

For each scenario, the results achieved in the 2020-2030 period, and the level of economic development of the region, are shown in the table below.

Table 13. The results and the level of development of the region in each of the scenarios

	moderate (neutral)	optymistic	pessymistic
The result in 2020-2030	The lodzkie region remains at a good level of economic development. GDP growth rate will be on average 3,7%. In 2030, the ratio of GDP per capita in PPS for the Lodzkie Region in relation to the EU-27 will reach 95,9%.	The lodzkie region is growing faster than in the baseline scenario and reduces its distance to the Masovian and Silesian Voivodeships. In 2030, the ratio of GDP per capita in PPS for the Lodzkie Region in relation to the EU-27 will reach at least 105%.	The lodzkie region remains at an average level of economic development. In 2030, the ratio of GDP per capita in PPS for the Lodzkie Region in relation to the EU-27 will reach 94,6%.
The region's development level	Innovation steadily developed in the key industries. Well developed, innovative, large service and industrial companies. Gradual SME innovation building thanks to support systems. 22-28% of innovative businesses in the region. Partially efficient e-administration. R&D expenditures reaching 1,7% GDP. Establishment of cooperation between regional authorities, society, enterprises and the area of science. Professionalization of services and business environment institutions. Gradual creation of a single, integrated business environment system. Creation of new cluster initiatives and consolidation of the position of the existing ones.	High innovation in the key industries. Large service and industrial companies as well as innovative SMEs shall be the driving force behind growth of the region's innovation in the future. 30-40% of innovative businesses in the region. Effective e-administration. Close cooperation between regional authorities, society, enterprises and the area of science. Professionalization of services and business environment institutions. Creation of a single, integrated business environment system. Efficient transfer of technologies, formation of academic spin-off companies. Occurrence of many well-rooted clusters, supporting the development of functional areas. R&D expenditures reaching 3% GDP.	Low level of innovation in the key industries. 16-18% of innovative businesses in the region. Insufficient support from the local authorities for dynamic development of enterprises and science. R&D expenditures reaching 1,04% GDP. No stable conditions for the development of business environment institutions. Their activities will still not be sufficiently coordinated.

Source: Own study.

A detailed description of the socio-economic development of the region in each of the scenarios is presented below.

For each option, there is a division of the main areas:

- Institutional and legal environment;
- Economy;
- Research and development;
- Innovative companies;
- Business environment institutions;

- Human capital;
- Society.

3.1 Moderate scenario

It is assumed that a moderate scenario is a baseline variant, with the highest probability of realisation. The expected GDP growth rate in this scenario is 3,4% - 3,7%.

Table 14. Prognosis of the average annual growth rate of GDP

	2010	2011-2020
UE	2,1%	1,4-2,6%
Poland (lodzkie region)	3,9%	3,4-3,7%

Source: Own development based on GUS, Eurostat and available economic analyses.

In this scenario, the lodzkie region has a chance to nearly reach the level of the European Union' present day GDP in 2030.

Table 15. Prognosis of the relations of GDP per capita in PPS[46] for Poland and the Lodzkie Region to the EU-27 = 100, while maintaining the momentum of growth from the years 2001-2010

	2010	2011-2020	2021-2030
Lodzkie region	57,00%	72%	95,90%
Polska	63%	75,5%- 77%	95,2%- 97,2%

Source: own development based on the forecasts prepared for MRR by the Bureau for Investment and Economic Cycles and Pracownia Naukowo-Edukacyjna PRIMUS.

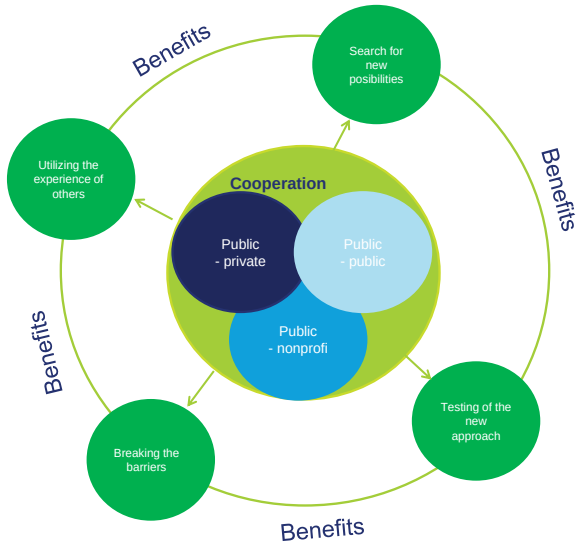
Institutional and legal environment

In the perspective up to the year 2030, there will be significant changes in the way the state is governed. Improving the functioning of the state is important for the development of entrepreneurship, as well as for the development of modern public services. The state should create a stable, predictable environment for business. Changes at the national level will translate into the functioning of government at the regional level. A new model of governance will be based on the principles of openness, transparency, friendliness, subsidiarity and participation.

The deregulatory reforms and improvement of the quality of legislation (clear, consistent, does not involve the possibility of multiple interpretations) undertaken today will allow the elimination of most of the legal and administrative burdens. This enables the quality and availability of public services to increase, and there will be additional funds generated by increasing the efficiency of the administration. The development of e-administration will take place. Some things will only be dealt with through the Internet. Unfortunately, administration will not be fully upgraded in smaller offices at the municipal level. The importance of public -private partnerships, as an expression of the participatory management model, will increase.

46 Parytet siły nabywczej, PSN (Purchasing Power Parity, PPP) - exchange rate calculated on the basis of the comparison of the prices of the rigidly fixed basket of goods and services in different countries at the same time expressed in the currencies of these countries. It allows for international comparisons of GDP.

Figure 21. Benefits resulting from the participatory, open model of state management



Source: Own study.

Small and medium-sized enterprises will be given the necessary support through programmes prepared for them. One of the priorities will be to raise innovation in enterprises by encouraging capital investment in Polish and foreign technologies, as well as stimulation of the financial market to create a wider range of businesses. The regional authorities will also support the development of enterprises' own research and development, through participation and cooperation with scientific institutions.

Thanks to the investments in infrastructure, the region will increase its external and internal availability, which will result in, among others, increase of the social mobility, and the less developed sub regions will not increase their distance to the most developed. Good transport conditions will be an incentive for investors.

The key issue for development opportunities in the region will be the ability to absorb the grants given (real ability to co-finance projects, the effectiveness in removing and evading legal and bureaucratic obstacles). Due to the fact that the amount of aid from the EU will decrease, other mechanisms for financing investments, aimed at return funding, will develop.

Economy

The region's economy will become competitive and innovative. It will develop, among others, on the basis of social capital. Sustainable development of the region will be a priority for all actors of society and the economy. One of the aspects of sustainable development will be the responsible use of existing natural resources in the region. Innovative management practices will minimise the negative impact of industry on the environment.

Structural changes in the economy of the Lodzkie Region will not run abruptly. One should expect them rather to be a gradual continuation of currently observed trends. Another factor accelerating structural changes will be the improvement of the infrastructure and related migration of people.

Industry and services will rapidly develop in the region. The economy will become strongly linked to the sphere of science. Strong growth will particularly occur in industries defined as crucial for the region. Focusing the attention of local innovation system actors towards the industry and integrated efforts to modernise it will prove to be one of the most important factors for success.

There will be a diversification of the energy sources used. To meet the challenge of reducing CO2 emissions, the companies will use modern technologies and tools to reduce CO2 emissions. The share of non-carbon energy sources will increase. EU regulations impose an obligation on Member States to increase the share of biofuels in transport to 10%. The region has considerable resources for the production of biofuels, which it will use, as it will use the available geothermal deposits. The problem of technology -outdated transmission as well as electricity and heat distribution systems will be partially solved by the development of industrial infrastructure and an intelligent network. The development and management of an intelligent electricity network will be aided by modern IT tools, which will have an impact on improving energy efficiency, animation of consumers, increasing competition and energy security of the region and the country.

The region will become a strong centre of industry and research in the medical (including the spa one), pharmaceutical and cosmetics industries. It will specialise in health care and spa services, which will be important due to the aging of the population. In addition, this industry will achieve high export potential (mainly advanced medical materials). Along with the development health services, the voivodeship will become an attractive holiday destination because of its tourist and natural values.

The traditional and less innovative clothing and textile industry, thanks to the strong financial support from the operational programmes and enterprises, will transform into a thriving industry, producing modern fibbers and fabrics. The development of new methods of textile production and giving them special features through methods of physical, chemical and biological modification, including the use of nanotechnology, the incorporation of electronic components, such as monitoring the functioning of the human body (textronics), manufacturing of composite materials with outstanding mechanical strength, will contribute to overall progress and create opportunities to meet foreign competition. SMEs working with research facilities in the area of control of modern textile technology: materials that are smart, biocompatible, biodegradable, non-flammable and protecting against UV radiation, electric or magnetic field, etc. will have great prospects for development. Additionally, the role of the region as a centre of creative industries, including fashion, will increase. The role of the region as a manufacturer and exporter of advanced building materials (ceramics, adhesives, mortars, polymer materials) and food will also increase.

The service sector will also bloom. Its importance and contribution to the region's GDP will increase significantly. First of all, it will be information technology, telecommunications, financial and logistical services. Projected trends to increase the share of the services market in the economy, mainly at the expense of the broadly defined agriculture, are largely a consequence of the convergence of the Polish economy, in terms of structure, to the more developed economies of Western Europe.

The differences in the level of the development of Lodz and the central counties and Bełchatów in relation to the other counties, especially the ones covering the towns loosing social- economic functions to the greatest extent, and the regions with the poorest availability to the public services will remain relatively stable.

Agriculture will be the slowest growing sector. Its share in value-added production will gradually reduce to a level comparable with the highly developed countries. At the same time, in the coming years, building on the achievements of biological sciences, chemistry, engineering, electronics and technology will gain more perfect, safe and high-quality food. The aim will be to use less chemicals, get more efficient plant varieties and animal breeds (increased resistance to diseases, better use of the nutrients for production, better adaptation to the environment). The structure of the farms will gradually change (consolidation of soils and creation of larger households), the degree of production mechanization will increase. In many small and medium-sized farms, the subsidies from funds will be mostly allocated for investment rather than for the current consumption. Thanks to the programmes for increasing the attractiveness

of the investment in rural areas and stimulating entrepreneurship, diversity of the economic activity forms will increase and there will be additional sources of income. Due to the needs of consumers who prefer healthy lifestyles, some farms will specialize in the production of the high quality eco-food. The demand for products made according to traditional recipes will increase on the market. Interdisciplinary research teams consisting of the specialists in natural, technical and economic fields will support the transformation processes in agriculture.

Research and development

Countries that have allocated significant resources to research and development for years are the technology leaders in the world today. The most important condition is to bear sufficiently high expenditure on science and the R&D, leading to the development of research capacity. Another important condition is to increase the efficiency of the organisation of education, science and research. It is also important to focus efforts on selected areas of science and to create the efficient system of knowledge diffusion to the economy.

The moderate scenario assumes a gradual increase in spending on research and development. It is assumed that in 2030, it will reach at least 1,7% of GDP.

Table 16. The projected increase of expenditures for R&D activity

	2010	2020	2030
Expenditures for R&D activity in relation to GDP	0,64% PKB	1% PKB	1,7% PKB

Source: Own development, forecast for 2020 was based on the value of the indicator adopted in the project of Update of the Development Strategy for the Lodzkie Region 2020 (project, January 2013).

The increase of funding on research, at both national and regional levels, will follow successively. In the initial period, focus on increasing the research funding will be placed on EU funds, then the companies will take over the leading role.

Expenditures for R&D in the lodzkie region businesses will slowly increase from 2017, but it will become noticeable after 2020. The tendency of enterprises to fund research will increase, thanks to the awareness-raising projects, carried out in the region, aimed at overcoming psychological barriers. Facing market changes and increasing competition, businesses, especially small ones, will have to move from a quick profit-oriented short-term planning towards long-term planning, which aims to gradually gain competitive advantage with products of high quality and modern customer service. This scenario applies to companies in traditional industries (such as electrical engineering and mechanical industry, building materials industry) and some high-tech industries (IT, telecommunications). Companies operating in traditional industrial sectors, due to the increasing competition, will be forced to upgrade production technology in order to stay on the market and increase their share in it. External R&D support will be very important for them. In the case of high-tech companies, lack of support for the effects of the R&D can also undermine their market position. However, in view of the fact that they already often conduct their research or cooperate with scientists, the increase of resources for R&D in their case will occur earlier.

Cooperation between science and industry will be gradually intensified - as a result of the slow process of becoming aware of the benefits of such cooperation by both parties and the emergence of the need for such cooperation, caused by market factors. The emergence of specialised institutions of the business environment on the regional market will also be a factor conducive to the development of cooperation between science and industry. Development of cooperation between science and businesses will take

place in several stages. In the first stage, the key is to break the mutual distrust. At this stage, the support of intermediaries that encourage cooperation will be invaluable. The second phase will focus on establishing communication and networking. In the third stage, which will take place after 2020, effective cooperation will be established.

Large international companies existing in the region will be more likely to benefit from local R&D potential, which will be partly forced by regional authorities. This will be followed by the internationalisation of research.

Regional research centres will also reach such a level of development in selected areas that they will be offering their services to the industry in the country and around the world.

In terms of research, there will be a change of the balance between basic, applied, and developmental science. This will increase the importance of applied sciences. Scientific and industrial consortia will be created more often.

The reform of the education system, gradually introduced from 2010-2011, will result in changes in the model of financing science (increase of funding by the companies, changing the structure of demand for R&D services reported by the economy). Introduction of competitive elements to the R&D sphere will improve the quality of research.

Endogenous development potential of the region, associated with the industrial traditions and natural resources as well as the use of modern technologies leads to the formation of regional specialty in the lodzkie region. Moreover, the scientific specialisation of the region to the sciences of a neutral character, i.e. the ones which are not closely related to the regional specialisation (e.g. humanities) will also occur. Factors affecting the development of scientific specialties in the region are the academic staff, training in their field, and research infrastructure, associated with significant capital investment, providing a direction for research and development works. The highest scientific potential of the region is concentrated in industrial and medical sciences (electronics, computer science, telecommunications, biotechnology, pharmacology, materials engineering, mechatronics, nanotechnology and functional materials, modern design, information technology). The importance of these sciences will continue to grow and will greatly assist the economic development of the region. Tendencies towards the emergence of a growing number of multi-disciplinary specialisations, such as merging medical sciences with the technical, will also increase.

Innovative companies

The driving force behind the region's innovation growth in the future will be large industrial and service companies. SMEs will be characterised by a high growth rate. By 2020, the number of SMEs will have increased by approx. 14%, mainly due to the activities of regional authorities to promote productive investment and services that contribute to the creation and maintenance of sustainable jobs, the development of small and medium-sized companies in the high technology sector and companies using new technologies, as well as businesses in key regional industries and businesses commercialising research.

Faster development of large enterprises will be driven by their greater ability to obtain competitive advantages resulting from technological progress. These companies have more resources to invest, and often have their own research facilities. They often use the scale effect of production. Large enterprises with foreign capital, operating in the corporate structure, use globalisation factors to reduce operating

costs, the possibility to geographically disperse the production, or a better selection of qualified staff, as well as ease in reaching out to new markets. Support from EU programmes will affect the increase of the level of innovation in smaller firms, and their ability to transfer new technologies from research to production processes in the coming years will improve. SME innovation will be significantly impacted by the growth of cooperation between large companies and SMEs. SMEs will often start various forms of cooperation with large companies - the „umbrella" form of cooperation will be created in the region (SMEs will operate as subcontractors, or contractors of selected services or production processes). The efficiency of production processes and businesses will increase with such a specialisation.

The lodzkie region will continue to be attractive in terms of investment. Lodzkie region will use its convenient, central location and improving road infrastructure, communications, and data communications, as well as significant resources of skilled labour, to attract investors, so that the region will become a European centre of outsourcing. By 2020, investors will be able to take advantage of the favourable conditions for doing business (e.g. through tax credits) in special economic zones. This in turn will influence the development of technology and know-how transfers into the region. SEZ will be a good tool for creating cooperative relations networks, by e.g. initiating cluster structures. Despite initial concerns about the decline in popularity of SEZs and the EU regional policy and the associated regional aid, the functioning of SEZs will not be endangered. The European Commission will not undermine the functioning of the SEZs after 2020, if the areas continue to be part of the Community's regional policy, whose aim is to help the less developed regions and to reduce disparities in the level of the EU's development, and zoning regulations will be compliant with the regulations of the Community's regional aid regulations.

Development of innovation will be supported by diverse financial instruments, including instruments designed for high-risk ventures. The regional authorities will support this type of initiative on the assumption that these instruments can contribute to the development of ambitious, highly innovative projects. Public support for innovators will be directed primarily to small and medium-sized businesses, particularly start-ups, as they face the greatest financial barriers and have limited opportunities for risk diversification.

Business environment institutions

In the long term perspective, the number of business will increase. The new centres will appear in the parts of the region, where today there is a clear deficit in this regard. However, they will require adequate public support in order to ensure their durability and create a stable environment for development. For the whole system of innovation centres, the regional local authorities will create effective instruments tailored to the level of the centre's development, including their differentiation capabilities and ability to provide a variety of services, especially in terms of pro-innovation. Networking and integration of different categories of support institutions will also be stimulated, such as university technology transfer centres, pre-incubators and seed capital funds, wherever there is a reasonable limit of dispersion of resources and an increase of efficiency. Stimulating and use of horizontal cooperation between centres will lead to the professionalization of services, increasing the qualifications of the personnel, accumulation of knowledge and experience. A single integrated system of business will be gradually formed. At the city level, contact points will operate, responsible for providing basic information on entrepreneurship and innovation and proper management of stakeholders, depending on their needs, to more specialised institutions. In the case of key industries in the region, dedicated coordinators will be a link between the parties centred around the industries. Developed channels of communication and a clear division of responsibilities will guarantee a rapid flow of information and knowledge between the different elements of the system, supported by integrated electronic platforms.

The business environment institutions will employ people with high qualifications, characterised by openness, dynamic action, and focus on the goal. Among the services provided by them, coaching, mentoring, broker technology, preparation of business plans and feasibility studies will develop in particular.

Business environment centres will be equipped with modern infrastructure, available, in particular, for SMEs, for whom the limited financial resources will not allow to create their own R&D departments.

In the years 2017-2022, there will be a further increase in the number of cluster initiatives. This increase will be an expression of conscious choice and beliefs about the effectiveness of this form of business organisation, as well as the increasing competition on the external market. The regional authorities in the years 2013-2016 will take active steps to encourage companies and research centres to network, primarily through the promotion of positive experiences (good practices of other regions and countries), and identifying ways for small businesses to organise. First, clusters and cluster initiatives already in operation in the region will develop, and then new ones will emerge.

Human capital

The labour market will experience a gradual reduction of employment in traditional and low-productive sectors and branches of the economy, especially in agriculture, and the demand for highly skilled professionals, with technical and biological education, in high-tech industries and knowledge-intensive services will increase.

The needs of a modern regional labour market will cause a significant development of human capital through new directions of education, and improvement of the quality of education at all levels.

The society of the region will become better educated, about 30% of the voivodeship's population will have tertiary education and will increasingly contribute to the creation of economic development based on knowledge and innovation.

Table 17. Projections for the number of people with higher education

	2010	2020	2030
Share of the population aged 15-64 with tertiary education among the general number of population of this age	19,1%	24,4%	29%

Source: Own development on the basis of GUS data, forecast for 2020 was based on the value of the indicator adopted in the project of Update of the Development Strategy for the Lodzkie Region 2020 (project, January 2013).

Cognitive competence, the ability to acquire knowledge and creativity will be shaped in children from an early age, since in the early years one can detect and mitigate development deficits most effectively.

Universities will stand out by having more and more graduates, the most talented of which, due to the attractive conditions as well as the possibility of the further training, will decide to continue their research work at the universities. Many of the graduates will have done their internships and practices abroad, and part of their studies will have taken place at universities abroad. Secondly, as a result of the increase of the funding of science, employment conditions will improve and the income of workers in this sphere will increase.

The dwindling population of the region, including people of working age, will force the creation of special programmes to restore excluded people to the labour market. More people will also undertake a long-life learning type of study. The employment rate will rise to approx. 75% in 2030.

Table 18. The employment rate in 2007 and 2010 and projections for 2030

	2007	2010	2020	2030
Lodzkie region	59%	66,2%	73%	75%
Poland	57%	64,6%	71%	75%

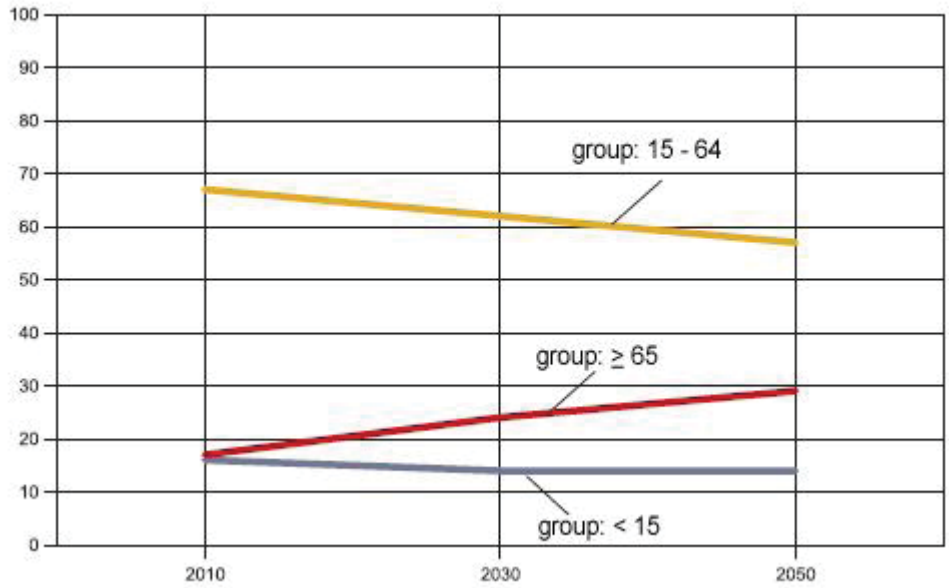
Source: Own development on the basis of GUS and Eurostat data, forecast for 2020 was based on the value of the indicator adopted in the project of Update of the Development Strategy for the Lodzkie Region 2020 (project, January 2013).

Human resources' ability to flexibly adapt to constant changes in production will be a key element in maintaining productivity. Labour market flexibility will be accompanied by job security. Employability of people will be increased. The flexicurity[47] model will be the best way to ensure this protection, it will help employees take advantage of changes on the labour market and change their workplace for the better, thanks to the ability to acquire and adapt their skills throughout their whole life, combined with conditions allowing for the transfer of these skills.

Society

A major problem for Europe today is the rapid aging of the population. In the lodzkie region, the population will decrease to 2.42 million people by 2020. The depopulation of the region will also deepen later, and in 2030 the region's population will decrease by almost 260 thousand of people in relation to 2011.

Figure 22. Population by age group in the EU-27 in the year 2010, 2030 and 2050



Source: Eurostat (convergence scenario)

47 A term derived from the words: flexibility and security

Emigrants from the poorer parts of Europe, Asia and Africa will be employed in the basic jobs, not requiring high qualifications. With innovative management methods used in companies, mothers with children and the elderly will be able to return to work sooner.

By 2020, the level of civic consciousness will increase, which is the main determinant of the development of a civil society. The higher level of education will contribute to this, both in terms of nurturing, as well as civic education. By creating a regional brand and a consistent promotion outside of the region, the majority of the population will be identified with the voivodeship. The change in the level of civic awareness will also be affected by other factors, such as integration of Lodz with other regions of Poland, the European Union, and twin regions in the EU.

The whole voivodeship will be covered with an IT network. Internet will become a universal tool of communication for all households. Today's generation of 20-30 year olds which uses ICT tools smoothly, will come into adulthood, which is why the percentage of older people using modern technologies will increase.

Table 19. Estimated level of the use of computers and the Internet

	2010	2030
Percentage of people who have never used the Internet	33%	10 %
Companies who have access to the Internet	91,5%	97 %

Source: Own study.

Similarly, the majority of business processes will occur in the network. Companies that do not use computers and the Internet will not have a chance to survive on the market.

The innovations will be implemented not only in the economy, but will also become a permanent part of the social and cultural life.

3.2 Optimistic scenario

The lodzkie region is the „promised land" for entrepreneurs, investors, residents, where:

- any innovative idea is feasible,
- tradition meets modernity,
- creativity is the engine of development.

It is assumed that the optimistic scenario is likely to materialise on condition of consistent implementation of innovation policy in the country and the region, and the occurrence of favourable external conditions. The estimated ratio of GDP per capita for the lodzkie region to the EU will be higher than the ratio of GDP per capita for Poland to the EU.

Table 20. Estimated relation of GDP per capita in PPS for Poland and the lodzkie region to the EU-27 = 100 in the perspective up to the year 2030

	2010	2011-2020	2021-2030
Lodzkie region	56,1%	>77%	>105%
Poland	63%	75,5%- 77%	95,2%- 97,2%

Source: Own study.

The history of development of some countries (Japan, South Korea, Republic of China) and regions in the world shows that fast economic growth is possible by directing attention and efforts to a significant increase of the level of innovation. In Europe, an example of an innovative economy based on strong industry, is Germany. The lodzkie region, through conscious and planned activities implemented in the region, can become a strong industrial basin investing in new technologies, supporting very large companies and the SMEs significantly increasing innovation. Impact of the developmental factors connected with infrastructure, quality of the human capital, development of entrepreneurship and sustainability of public finances, as well as better conditions for the increase of innovation are the opportunity for the dynamic increase of GDP per capita.

Institutional and legal environment

In the perspective up to the year 2030, there will be significant changes in the way the state is governed. Improving the functioning of the state is important for the development of entrepreneurship, as well as for the development of modern public services. The state should create a stable, predictable environment for business. Changes at the national level will translate into the way the government at the regional level is functioning. A new model of governance will be based on the principles of openness, transparency, friendliness, subsidiarity and participation.

Deregulatory reforms and improving the quality of legislation (clear, consistent, does not involve the possibility of multiple interpretations), that have already begun, will allow the elimination of most of the legal and administrative burdens. This will allow the quality and availability of public services to increase, and there will be additional funds generated by increasing the efficiency of the administration. E-administration will develop. Most matters will only be dealt with via the Internet. Resources of the offices operating in the voivodeship will be connected with IT network, which will allow for efficient information exchange between the aforementioned authorities and thus will make dealing with administrative matters easier for the citizens. Many initiatives will be implemented on the basis of public-private partnership. Thanks to this, many projects will be implemented in a much more efficient manner, on the other hand – solutions meeting environment and social standards will be created. Public-private partnership will help to fill the infrastructure gap and will allow for more balanced development of the counties, thus it will contribute to equalization of opportunity for companies operating in the less economically developed regions.

Small and medium-sized enterprises will be given the necessary support through the facility programmes prepared for them. One of the priorities will be to raise innovation in enterprises by encouraging capital investment in Polish and foreign technologies, as well as stimulation of the financial market to create a wider range of businesses. The regional authorities will also support the development of companies' own research and development centres, through the participation and cooperation with scientific institutions. The number of innovative enterprises will increase to 30-40%.

Thanks to the investment in infrastructure, the region will increase its external and internal availability which will result in, among others, an increase of social mobility, and the poorly developed sub regions will not increase the distance to those that are more developed. Good communication conditions will be an incentive for investors.

The key issue for development opportunities in the region will be the ability to absorb the grants given (real ability to co-finance projects, the effectiveness in removing and evading legal and bureaucratic obstacles). Due to the fact that the amount of aid from the EU will decrease, other mechanisms for financing investments, aimed at return funding, will develop.

Economy

The region's economy will become competitive and innovative. It will develop, among others, on the basis of social capital. Sustainable development of the region will be a priority for all actors of society and the economy. One of the aspects of sustainable development will be the responsible use of existing natural resources in the region. Innovative management practices will minimise the negative impact of industry on the environment.

Structural changes in the economy of the lodzkie region will run faster than in other regions. One should expect them rather to be a gradual continuation of currently observed trends. Another factor accelerating structural changes will be the improvement of the infrastructure and related migration of people.

Industry and services will rapidly develop in the region. The economy will become strongly linked to the sphere of science. Particularly strong growth will occur in industries defined as crucial for the region. Focusing the attention of local innovation system actors towards the industry and integrated efforts to modernise it will prove to be one of the most important factors for success. The regional authorities will establish a close relationship with twin regions in Europe, from which they will draw knowledge and experience. Representatives of business and science will be involved in the process. Joint trade missions and meetings will result in the creation of a network of international contacts. The production of complex industrial goods, especially capital goods, and innovative manufacturing technologies, will become the specialisation of the region.

There will be a diversification of the energy sources used. To meet the challenge of reducing CO2 emissions, companies will use modern technologies and tools to reduce CO2 emissions. The share of non-carbon energy sources will increase. EU regulations impose an obligation on Member States to increase the share of biofuels in transport to 10%. The region has considerable resources for the production of biofuels, which it will use, as it will use the available geothermal deposits. The problem of technology-outdated transmission as well as electricity and heat distribution systems will be partially solved by the development of industrial infrastructure and an intelligent network. The development and management of an intelligent electricity network will be aided by modern IT tools, which will have an impact on improving energy efficiency, animation of consumers, increasing competition and energy security of the region and the country.

The region will become a strong centre of industry and research in the medical (including spa one), pharmaceutical and cosmetics industries. It will specialise in health care and spa services, which will be important due to the aging of the population. In addition, this industry will achieve high export potential (mainly advanced medical materials). Along with the development health services, the voivodeship will become an attractive holiday destination because of its tourist and natural values.

The traditional and less innovative clothing and textile industry, thanks to the strong financial support from the operational programmes and enterprises, will transform into a thriving industry, producing modern fibres and fabrics. The development of new methods of textile production and giving them special features through methods of physical, chemical and biological modification, including the use of nanotechnology, the incorporation of electronic components, such as monitoring the functioning of the human body (textronics), manufacturing of composite materials with outstanding mechanical strength, will contribute to overall progress and create opportunities to meet foreign competition. SMEs working with research facilities in the area of control of modern textile technology: materials that are smart, biocompatible, biodegradable, non-flammable and protect against UV radiation, electric or magnetic field, etc. will have great prospects for development. Additionally, the role of the region as a centre of creative industries, including fashion, will increase. Creative industry will not only gain in economic importance, but will also become the model of the modern economy: it will offer uncommon employment opportunities, play a pioneering role on the road to a knowledge-based economy and will be a major source of new, innovative ideas.

The role of the region as a manufacturer and exporter of advanced building materials (ceramics, adhesives, mortars, polymer materials) and food will also increase. New types of food produced by the companies cooperating with the research centres will be designed and implemented for production. Polish food will have a high reputation in Europe as a healthy and eco-friendly product. The service sector will also bloom. Its importance and contribution to the region's GDP will increase significantly. First of all, it will be information technology, telecommunications, financial and logistical services. Projected trends to increase the share of the services market in the economy, mainly at the expense of the broadly defined agriculture, are largely a consequence of the convergence of the Polish economy, in terms of structure, to the more developed economies of Western Europe.

After 2020, the share of the economically less developed counties in the region's GDP will grow. Services will develop rapidly in those counties Changes in infrastructure (roads, telecommunication networks) will encourage investors to locate their business there.

Education and special activation programmes for farmers will encourage them to invest in new technologies used in land cultivation, horticulture and animal husbandry. Effective advisory system for farmers will function in the region. The structural changes in the agriculture, the profitability of production, outflow of young people to the cities, will result in a process of consolidation of small farms into large-scale enterprises. With a significant upgrade and mechanization of production, the farms will become the efficiently functioning entrepreneurs effectively competing on the European and global market. The most basic activities associated with crops will be carried out by specialist machinery and equipment. Planning and monitoring of crops will be conducted on computer systems. Food with unique nutritional, dietary and medicinal values, as well as with high resistance will be produced. Protection and use of recreational values of rural areas will also be an important activity. Highly qualified people able to manage the quality and produce food competitive in terms of quality and price will be employed in agriculture. Close cooperation with the research centres will ensure direct possibility of implementing all innovative solutions for agricultural production.

Research and development

Countries that have allocated significant resources to research and development for years are the technology leaders in the world today. The most important condition is to bear sufficiently high expenditure on science and the R&D, leading to the development of the research capacity. Another important condition is to increase the efficiency of the organisation of education, science and research. It is also important to focus efforts on selected areas of science.

The optimistic scenario assumes rapid growth in spending on research and development. It assumes the achievement of 3% of GDP in 2030.

Table 21. The estimated increase of expenditures for R&D

	2010	2020	2030
Expenditures for R&D activity in relation to GDP of the region	0,64%	2%	3%

Source: Own study.

In the initial period, the focus of increasing research funding will be placed on EU funds, then the companies will take over the leading role. The share of the companies in financing research and development will be 1,5-1,6%.

Expenditures for R&D in the lodzkie region businesses will slowly increase from 2015, but it will become noticeable after 2018. The tendency of enterprises to fund research will increase, thanks to the awareness-raising projects, carried out in the region, aimed at overcoming psychological barriers. Facing market changes and increasing competition, businesses, especially small ones, will have to move from a quick profit-oriented short-term planning towards long-term planning, which aims to gradually gain competitive advantage with products of high quality and modern customer service. This scenario applies to companies in traditional industries (such as electrical engineering and mechanical industry, building materials industry) and some high-tech industries (IT, telecommunications). Companies operating in the traditional industrial sectors, due to the increasing competition, will be forced to upgrade production technology in order to stay on the market and increase their share in it. External R&D support will be very important for them. In the case of high-tech companies, lack of support for the effects of the R&D can also undermine their market position. However, in view of the fact that they already often conduct their research or cooperate with scientists, the increase of resources for R&D in their case will occur earlier. The share of high-tech companies in the total number of enterprises will increase.

Cooperation between science and industry will be gradually intensified - as a result of the slow process of becoming aware of the benefits of such cooperation by both parties and the emergence of the need for such cooperation, caused by market factors. The processes of integration of the environments will take place faster than in the moderate scenario. The emergence of specialised institutions of business environment on the regional market will also be a factor conducive to the development of cooperation between science and industry. Development of cooperation between science and businesses will take place in several stages. In the first stage, the key is to break the mutual distrust. At this stage, the support of intermediaries that encourage cooperation will be invaluable. The second phase will focus on establishing communication and networking. In the third stage, which will take place after 2015, effective cooperation will be established.

Large national companies existing in the region will be more likely to benefit from local R&D potential, which will be partly forced by regional authorities. This will be followed by the internationalisation of research.

Regional research centres will also reach such a level of development in selected areas that they will be offering their services to the industry in the country and around the world. They will participate in many international projects.

In terms of research, there will be a change of the balance between basic, applied, and developmental science. This will increase the importance of applied sciences. Scientific and industrial consortia will be created more often.

The reform of the education system, gradually introduced from 2010-2011, will result in changes in the model of financing science (increase of funding by the companies, changing the structure of demand for R&D services reported by the economy). Introduction of competitive elements to the R&D sphere will improve the quality of research.

Endogenous development potential of the voivodeship, associated with the industrial traditions and natural resources as well as the use of modern technologies leads to the formation of regional specialisation in the lodzkie region. Moreover, the scientific specialisation of the region to the sciences of a neutral character, i.e. the ones which are not closely related to the region's specialisations, will also occur. Factors affecting the development of scientific specialties in the region are the academic staff, training in their fields, and research infrastructure, associated with significant capital investment, providing a direction for research and development works. The highest scientific potential of the region is concentrated in industrial and medical sciences (electronics, computer science, telecommunications, biotechnology, pharmacology, materials engineering, mechatronics, nanotechnology and functional materials, modern design, information technology). The importance of these sciences will continue to grow and will greatly assist the economic development of the region. Tendencies towards the emergence of a growing number of multi-disciplinary specialisations, such as merging medical sciences with the technical, will also increase.

Innovative companies

The driving force behind the region's innovation growth in the future will be large industrial and service companies. SMEs will be characterised by a high growth rate. By 2020, the number of SMEs will have increased by 25-30%, mainly due to the activities of regional authorities to promote productive investment and services that contribute to the creation and maintenance of sustainable jobs, the development of small and medium-sized companies in the high technology sector and companies using new technologies, as well as businesses in key regional industries and businesses commercialising research.

Faster development of large enterprises will be driven by their greater ability to obtain competitive advantages resulting from technological progress. These companies have more resources to invest, and often have their own research facilities. They often use the scale effect of production. Large enterprises with foreign capital, operating in the corporate structure, use globalisation factors to reduce operating costs, the possibility to geographically disperse the production, or a better selection of qualified staff, as well as ease in reaching out to new markets.

Support from EU programmes will affect the increase of the level of innovation in smaller firms, and their ability to transfer new technologies from research to production processes in the coming years will improve. SME innovation will be significantly impacted by the growth of cooperation between large companies and SMEs. SMEs will often start various forms of cooperation with large companies - the „umbrella" forms of cooperation will be created in the region (SMEs will operate as sub-contractors, or contractors of selected services or production processes). The efficiency of production processes and businesses will increase with such a specialisation.

The lodzkie region will continue to be attractive in terms of investment. It will use its convenient, central location and improving road infrastructure, communications, and data communications, as well

as significant resources of skilled labour, to attract investors. International investors will perceive the region as one of the most attractive economic centres. Foreign direct investment will increase. Foreign investors will primarily pay attention to the central geographic location of the lodzkie region, stability and legal security. In comparison to other economic centres, the region will stand out with its infrastructure (transport, telecommunications), the level of tertiary education and scientific research institutions, research and development activities aimed at industry and skilled workers.

Development of innovation will be supported by diverse financial instruments, including instruments designed for high-risk ventures. The regional authorities will support this type of initiative on the assumption that these instruments can contribute to the development of ambitious, highly innovative projects. Public support for innovators will be directed primarily to small and medium-sized businesses, particularly start-ups, as they face the greatest financial barriers and have limited opportunities for risk diversification.

Business environment institutions

In the long term perspective, the number of businesses will increase. The new centres will appear in the parts of the region, where today there is a clear deficit in this regard. However, they will require adequate public support in order to ensure their durability and create a stable environment for development. For the whole system of innovation centres, the regional local authorities will create effective instruments tailored to the level of the centre's development, including their differentiation capabilities and ability to provide a variety of services, especially in terms of pro-innovation. Networking and integration of different categories of support institutions will also be stimulated, such as university technology transfer centres, pre-incubators and seed capital funds, wherever there is a reasonable limit of dispersion of resources and an increase of efficiency. Stimulating and using horizontal cooperation between centres will lead to the professionalization of services, increasing the qualifications of the personnel, accumulation of knowledge and experience. A single integrated system of business will be gradually formed. At the city level, contact points will operate, responsible for providing basic information on entrepreneurship and innovation and proper management of stakeholders, depending on their needs, to more specialised institutions. In the case of key industries in the region, dedicated coordinators will be a link between the parties centred around the industries. Developed channels of communication and a clear division of responsibilities will guarantee a rapid flow of information and knowledge between the different elements of the system, supported by integrated electronic platforms.

The business environment institutions will employ people with high qualifications, characterised by openness, dynamic action, and focus on the goal. Among the services provided by them, coaching, mentoring, broker technology, preparation of business plans and feasibility studies will develop in particular.

Business environment centres will be equipped with modern infrastructure, available, in particular, for SMEs, for whom limited financial resources will not allow to create their own R&D departments.

In the years 2017-2022, there will be a further increase in the number of clusters and cluster initiatives. This increase will be an expression of conscious choice and beliefs about the effectiveness of this form of business organisation, as well as the increasing competition on the external market. The regional authorities in the years 2013-2016 will take active steps to encourage companies and research centres to network, primarily through the promotion of positive experiences (good practices of other regions and countries), and identifying ways for small businesses to organise. First, clusters and cluster initiatives already in operation in the region will develop, and then new ones will emerge.

The region will become a place for creation of high-tech clusters, also attractive for businesses and non Polish research centres. Some clusters will establish cooperation with the clusters functioning in other European countries.

Human capital

The labour market will experience a gradual reduction of employment in traditional and low-productive sectors and branches of the economy, especially in agriculture, and the demand for highly skilled professionals, with technical and biological education, in high-tech industries and knowledge-intensive services will increase.

The needs of a modern regional labour market will cause a significant development of human capital through new directions of education, and improvement of the quality of education at all levels. The systems of practices and apprenticeships will be well developed on the basis of the agreements concluded between the schools and universities and the entrepreneurs. Good education meeting the current needs and high internal mobility will result in the increase of operational efficiency, improvement of the quality of products and services, solving the problem of shortage of personnel, and equalizing the differences in the region's development.

The society of the region will become better educated, about 45 – 47% of the region's population aged 30-34 will have tertiary education and will increasingly contribute to the creation of economic development based on knowledge and innovation. The percentage of technical graduates will rise to 24%, following the examples set by Korea and Japan.

Table 22. Estimated share of people with tertiary education

	2010	2020	2030
Share of population aged 15-64 with tertiary education in the general number of population of this age	19%	29%	39%

Source: Own study.

Cognitive competence, the ability to acquire knowledge and creativity will be shaped in children from an early age, since in the early years one can detect and mitigate development deficits most effectively.

An increasing number of students will graduate from universities. Many of them will be able to show apprenticeships and work experience obtained abroad, and part of their studies will take place at universities abroad. Secondly, as a result of the increase of the funding of science, employment conditions will improve and the income of workers in this sphere will increase. Thanks to the strong support of the academic community, a number of spin-off and spin-out companies will be created.

The dwindling population of the region, including people of working age, will force the creation of special programmes to restore excluded people to the labour market. More people will also undertake a long-life learning type of study. The employment rate will rise to 75% in 2030. Human resources' ability to flexibly adapt to constant changes in production will be a key element in maintaining productivity. Labour market flexibility will be accompanied by job security. Employability of people will be increased. The flexicurity model will be the best way to ensure this protection, it will help employees take advantage of changes on the labour market and change their workplace for the better, thanks to the ability to acquire and adapt their skills throughout their whole life, combined with conditions allowing for the transfer of these skills.

Society

A major problem for Europe today is the rapid aging of the population. In the lodzkie region, the population will decrease to 2,42 million people by 2020. The depopulation of the region will also deepen later, and in 2030 the region's population will decrease by almost 260 thousand of people in relation to 2011.

Immigrants from the poorer parts of Europe, Asia and Africa will be employed in the basic jobs, not requiring high qualifications. With innovative management methods used in companies, mothers with children and the elderly will be able to return to work sooner.

By 2020, the level of civic consciousness will increase, which is the main determinant of the development of a civil society. The higher level of education will contribute to this, both in terms of nurturing, as well as civic education. By creating a regional brand and a consistent promotion outside of the region, the majority of the population will be identified with the voivodeship. The change in the level of civic awareness will also be affected by other factors, such as integration of Lodz with other regions of Poland, the European Union, and twin regions in the EU. Inclusion of the excluded and disadvantaged social groups, as well as demographic problems can become the source of many opportunities for the business sector through the emergence and growth of the previously disregarded market niches, e.g. associated with services for the elderly. Moreover, the change in the traditional model of the family (from the numerous family to the so called single model) may lead to the formation of new consumer trends and become an additional source of market opportunities for the companies, also in the field of new, innovative products.

The whole voivodeship will be covered with an IT network. The Internet will become a universal tool of communication for all households. Today's generation of 20-30 year olds which uses ICT tools smoothly, will come into adulthood, which is why the percentage of older people using modern technologies will increase. Implementing the strategy of the development of information society, the Government will decide to open many public data resources, archives, scientific publications and digital collections of culture eagerly used by the society. Many innovative ideas reported by the society on the websites made available for this purpose will be the basis for the introduction of changes in political, cultural and social life.

Similarly, the majority of business processes will occur in the network. Companies that do not use computers and the Internet will not have a chance to survive on the market.

3.3 Pessimistic scenario

The pessimistic scenario is a negative deviation from the moderate scenario. This scenario assumes that the Lodzkie Region will remain at an average level of economic development, it will also not take up its development opportunities. The estimated ratio of GDP per capita for the lodzkie region to the EU will be lower than the ratio of GDP per capita for Poland to the EU.

Table 23. The estimated relation of GDP per capita in PPS for Poland and the lodzkie region to the EU-27 = 100 in the perspective up to the year 2030

	2010	2011-2020	2021-2030
Lodzkie region	56,1%	72%	94,6%
Poland	63%	75,5%	95,2%

Source: Own study.

Institutional and legal environment

In the perspective up to the year 2030, there will be changes in the way the state is governed. Improving the functioning of the state is important for the development of entrepreneurship, as well as for the development of modern public services. The state should create a stable, predictable environment for business. Changes at the national level will translate into the functioning of government at the regional level. A new model of governance will be based on the principles of openness, transparency, friendliness, subsidiarity and participation.

The deregulatory reforms and improvement of the quality of legislation (clear, consistent, does not involve the possibility of multiple interpretations) undertaken today will be undertaken too slowly to fully eliminate most of the legal and administrative burdens. The quality and availability of public services will partially increase. E-administration will develop, but only for the selected services. Unfortunately, administration in smaller offices at the municipal level will not be fully modernised.

Small and medium-sized enterprises will be given the necessary support through programmes prepared for them and, although one of the priorities will be to raise innovation in enterprises by encouraging capital investment in Polish and foreign technologies, as well as stimulation of the financial market to create a wider range of businesses, these opportunities will not be used. The majority of funds will be used for current purposes, without taking into account the long-term strategy for the development of technologies in enterprises.

Investments in the infrastructure will not be sufficient to implement those investments that enable full increase of external and internal accessibility, among others, for launching the High Speed Rail. The social mobility will be insufficient for the less developed sub-regions to decrease their distance to the most developed.

The key issue for development opportunities in the voivodeship will be the ability to absorb the grants provided (real ability to co-finance projects, the effectiveness in removing and evading legal and bureaucratic obstacles). Unfortunately, not all barriers will be eliminated, which will still inhibit some parties from applying for the funds.

Economy

The region's economy will remain at an average level of development. Sustainable development of the region will be a priority specified in the strategies, however the lack of coherence and consequence in actions will result in only a few areas experiencing noticeable progress. The structural changes in the economy of the lodzkie region will take place slowly. A gradual continuation of the currently observed trends should be expected. Another factor accelerating structural changes will be the improvement of the infrastructure and related migration of people.

Industry and services will still develop in the region. The economy will become strongly linked to the sphere of science, especially in industries defined as crucial for the region.

There will be a diversification of the energy sources used. To meet the challenge of reducing CO2 emissions, companies will notice the need for the modernization of technologies and tools allowing to reduce CO2 emissions. The share of non-carbon energy sources will increase. EU regulations impose an obligation on Member States to increase the share of biofuels in transport to 10%. The region has considerable resources for the production of biofuels, which it will use, as it will use the available geothermal deposits. The problem of outdated technology systems, transmission and distribution of electricity and heat will remain a great problem.

The region will become a relatively strong centre of industry and research in the medical, pharmaceutical and cosmetics industries. It will specialise in health care services, which will be important due to the aging of the population. Along with the development of health services, the voivodeship will become an attractive holiday destination, because of its tourist and natural values.

The traditional and less innovative clothing and textile industry, thanks to the strong financial support from the operational programmes and enterprises, will develop faster, but for a long time it will not reach its critical mass. The role of the region as a manufacturer and exporter of advanced building materials (ceramics, adhesives, mortars, polymer materials) and food will also increase.

The service sector will also bloom. Its importance and contribution to GDP of the region will increase significantly. First of all, it will be information technology, telecommunications, financial and logistical services. Projected trends to increase the share of the services market in the economy, mainly at the expense of the broadly defined agriculture, are largely a consequence of the convergence of the Polish economy, in terms of structure, to the more developed economies of Western Europe.

The voivodeship will continue to maintain its imbalance in development between the particular counties. The differences in the level of the development of Lodz and the central counties and Bełchatów in relation to the remaining parts of the voivodeship will not be mitigated. The share of other counties in Lodz's economy will remain relatively stable or it will decrease.

Agriculture will be the slowest growing sector. Its share in value-added production will be reduced to a level comparable with the highly developed countries. Simultaneously, however, the changes in the sector will be relatively slow. The structure of the farms, which is the consequence of the existing system of direct subsidies for agricultural production, will not change. For the majority of small and medium-sized farms, the subsidies from funds are in fact primarily allocated for consumption, and only on large farms do they strengthen the investment processes.

Research and development

The pessimistic scenario assumes a gradual increase in spending on research and development. It is assumed that in 2030, it will reach 1,04% of the regional GDP.

Table 24. The estimated increase of expenditures for R&D activity

	2010	2020	2030
Expenditures for R&D activity in relation to GDP of the region	0,64%	0,84%	1,04%

Source: Own study.

In the initial period, focus of increasing the research funding will be placed on EU funds.

Expenditures for R&D in the lodzkie region businesses will slowly increase from 2022, but it will become noticeable after 2026. The tendency of enterprises to fund the researches carried out in the region will increase through awareness-raising projects, aimed at overcoming psychological barriers, but they will not be implemented efficiently enough to convince entrepreneurs and the sphere of science to cooperate. Facing market changes and increasing competition, businesses, especially small ones, will have to move from a quick profit-oriented short-term planning towards long-term planning, which aims to gradually gain competitive advantage with products of high quality and modern customer service. Not all businesses will be able to meet these requirements, and thus they will have to stop functioning.

Cooperation between science and industry will be gradually intensified - as a result of the slow process of becoming aware of the benefits of such cooperation by both parties and the emergence of the need for such cooperation, caused by market factors. The emergence of specialised institutions of the business environment on the regional market will also be a factor conducive to the development of cooperation between science and industry. Development of cooperation between science and businesses will take place in several stages. In the first stage, the key is to break the mutual distrust. At this stage, the support of intermediaries that encourage cooperation will be invaluable. The second phase will focus on establishing communication and networking. In the third stage, which will take place after 2025, effective cooperation will be established.

Because of the fairly unstable situation, lack of coherence in the activities undertaken within the frameworks of the regional development strategy, as well as the existence of a number of administrative barriers and the lack of the officials' creative attitude towards the activities carried out, large national companies existing in the region will still keep their R&D centres outside of the region.

In terms of research, there will not be any significant change of the balance between basic, applied, and developmental science. There will be a slight increase in the importance of applied sciences. Scientific and industrial consortia will be created, however, only sporadically.

The reform of the education system, gradually introduced from 2010-2011, will result in changes in the model of financing science (increase of funding by companies, changing the structure of demand for R&D services reported by the economy). Introduction of competitive elements to the R&D sphere will improve the quality of research.

Endogenous development potential of the voivodeship, associated with the industrial traditions and natural resources as well as the use of modern technologies will lead to the gradual formation of regional specialisation in lodzkie region. Moreover, the scientific specialisation of the region to the sciences of a neutral character, i.e. the ones which are not closely related the region's specialisations, will also occur. Factors affecting the development of scientific specialties in the region are the academic staff, specialising in their field, and research infrastructure, associated with significant capital investment, providing a direction for research and development works. The highest scientific potential of the region is concentrated in industrial, medical, agricultural sciences (electronics, computer science, telecommunications, biotechnology, pharmacology, materials engineering, mechatronics, nanotechnology and functional materials, modern design, information technology). The importance of these sciences will continue to grow, but it will support the economic development of the region only partially. Much more often foreign entities will be interested in the results of research.

Innovative companies

The driving force behind the region's innovation growth in the future will be large industrial and service companies. By 2020, the number of innovative SMEs will remain at today's level.

Faster development of large enterprises will be driven by their greater ability to obtain competitive advantages resulting from technological progress. These companies have more resources to invest, and often have their own research facilities. They often use the scale effect of production. Large enterprises with foreign capital, operating in the corporate structure, use globalisation factors to reduce operating costs, the possibility to geographically disperse the production, or a better selection of qualified staff, as well as ease in reaching out to new markets.

Support from EU programmes will affect the increase of the level of innovation in smaller firms, and their ability to transfer new technologies from research to production processes in the coming years will improve slowly. SME innovation would be significantly impacted by the growth of cooperation between large companies and SMEs, but this opportunity will still be used relatively rarely.

The lodzkie region will continue to be attractive in terms of investment, but low costs of employment will still be the biggest advantage of the region. The lodzkie region will use its convenient, central location, and improving road infrastructure, communications, and data communications, as well as significant resources of skilled labour, to attract investors. By 2020, investors will also be able to take advantage of the favourable conditions for doing business (e.g. through tax credits) in special economic zones, but because of the decreasing level of tax credits this possibility will be less and less attractive for them.

Business environment institutions

In the long term perspective, the number of business will increase. The new centres will appear in the parts of the region, where today there is a clear deficit in this regard; however this will be a result of the bottom-up initiative of entrepreneurs or the method for spending EU funds. Planning the distribution of financial resources will not be effective. Further organizational entities will still be appointed within the framework of the operating entities, exclusively for the purpose of separating the implementation of a given project, which will often lead to unnecessary situations where one institution for various projects appoints further external and internal structures unnecessarily complicating management processes and making the manner of funds distribution not transparent. Therefore, business environment institutions will not be provided with an environment for stable development. Their actions will still not be sufficiently coordinated and they will still remain in a precarious financial situation dependent on EU funds. The unattractive offer of the centres, as well as the lack of proper promotion of these centres among the entrepreneurs, will result in the fact that they will deal with the problem of low usability and usefulness. The opportunity of horizontal cooperation between the centres which may lead to the professionalization of the services, increasing the qualifications of personnel, accumulation of knowledge and experience, will not be used.

Business environment centres will be equipped with modern infrastructure, but the lack of clear procedures pertaining to its use and low awareness of its availability on the part of the SMEs will cause that e.g. science and technology parks will continue to have trouble finding a sufficient number of tenants.

In the further years, there will be a small increase in the number of clusters. This increase will be an expression of conscious choice and beliefs about the effectiveness of this form of business organisation, as well as the increasing competition on the external market, but it will affect only selected groups of companies.

Human capital

The labour market will experience a gradual reduction of employment in traditional and low-productive sectors and branches of the economy, especially in agriculture, and the demand for highly skilled professionals, with technical and biological education, in high-tech industries and knowledge-intensive services will increase. The number of innovative companies will not be large enough to employ all graduates, so there will be an outflow of educated staff to other regions.

More and more students will graduate from universities. Many of them will do their internships and work experience abroad, and part of their studies will take place at universities abroad, however, the lack of good prospects in the region will force them to emigrate.

The dwindling population of the region, including people of working age, will force the creation of special programmes to restore excluded people to the labour market. More people will also undertake a long-life learning type of study. The employment rate will rise to 75% in 2030. Human resources' ability to flexibly adapt to constant changes in production will be a key element in maintaining productivity. A suitable offer in this area will gradually appear.

Society

A major problem for Europe today is the rapid aging of the population. In the lodzkie region, the population will decrease to 2,42 million people by 2020. The depopulation of the region will also deepen later, and in 2030 the region's population will decrease by almost 260 thousand of people in relation to 2011.

By 2020, the level of civic consciousness will increase slightly, which is the main determinant of the development of a civil society. The higher level of education will contribute to this, both in terms of nurturing, as well as civic education. The region will continue to lack effective cooperation in various dimensions – at the level of sectors, inside the companies and finally within the framework of the local society. The region's social capital will continue to be referred to as one of survival and adaptation, i.e. largely taking the form of closed social networks, remaining in isolation from institutions and from each other.

The whole voivodeship will be covered with an IT network. Internet will become a universal tool of communication for most households. Today's generation of 20-30 year olds which uses ICT tools smoothly, will come into adulthood which is why the percentage of older people using modern technologies will increase. Similarly, the majority of business processes will take place in the network. Companies that do not use computers and the Internet will have little chance of survival on the market.

Chapter 4

Vision, mission, strategic and operational objectives

Vision and mission of RIS LORIS 2030

Principles of conducting the innovation policy of RIS LORIS 2030

4. Vision, mission, strategic and operational objectives

4.1 Vision and mission of RIS LORIS 2030

The Lodzkie Region Government is responsible for the complex activities, being a part of the innovation policy, which should be based on a system approach to support regional specialisation, as well as to support innovation of the entities of the Lodz Innovation System. By coordinating and directing the activities of pro-innovation and the creation of the Regional Innovation System, the Lodzkie Region Regional Government should create conditions for strengthening demand for innovation, and increasing the supply of innovation in the region. A system approach and identification of key areas for development will ensure synergies and improve the quality of the innovation policy in the region, which in turn will result in the development of the region and improve the quality of life of the inhabitants of the lodzkie region.

Vision of the Innovative Lodzkie Region in 2030

The Development Strategy for the Lodzkie Region 2020 is the most important strategic document at the regional level. It sets out a vision of the Lodzkie Region in 2020, as a region, which is: *„image-contiguous and cohesive, creative and competitive in the country and Europe, with the best transport accessibility, outstandingly high quality of life".*

With reference to the Development Strategy for the Lodzkie Region 2020 mentioned above, as well as due to the fact that the Regional Innovation Strategy for the Lodzkie Region – "LORIS 2030" clarifies the document in relation to the subject of innovation, **the proposed provision of the RIS LORIS 2030 vision is as follows:**

THE LODZKIE REGION IS THE „PROMISED LAND" FOR ENTREPRENEURS INVESTORS AND RESIDENTS, WHERE:

- ANY INNOVATIVE IDEA IS FEASIBLE,
- TRADITION MEETS MODERNITY,
- CREATIVITY IS THE DRIVING FORCE OF DEVELOPMENT.

The mission related to the implementation of the vision of the Innovative Lodzkie Region in 2030

The Development Strategy for the Lodzkie Region 2020 indicates a mission: *Keeping an integrated and territorially-oriented sustainable development policy based on economic co-operation, building of social ties and a regional identity.*

In regard to the mission indicated in the Development Strategy for the Lodzkie Region 2020, the mission related to the implementation of the Regional Innovation Strategy for the Lodzkie Region – "LORIS 2030" is:

ACTIVE INNOVATIVE POLICY WITH THE USE OF THE REGION'S INTERNAL POTENTIAL TO STIMULATE CREATIVITY AND ENTREPRENEURSHIP AMONG THE PEOPLE TO ENSURE SUSTAINABLE DEVELOPMENT.

The Lodzkie Region in 2030 is the region:

- Where diversity is strength.
- Which has its cultural and economic identity.
- Which is open and favourable to businesses.
- Of creative people and businesses.
- Of strong and competitive local business.
- Of local patriots.

4.2 Principles of conducting the innovation policy of RIS LORIS 2030

Principles of innovation policy:

Efficiency:

- In conducting regional policies affecting the construction of added economic value in the region with the use of innovation.
- Taking action and disbursement of funds, so that they are focused on and aimed precisely at the objectives that may have the greatest impact on the development of the region.
- Ensuring diversity of innovation support instruments, depending on the type of problem addressed.
- Developing effective criteria for the selection of projects based on the needs and capabilities of potential beneficiaries.
- Reducing the time and simplifying the application process for funding of the implementation of innovation policy and preferring projects realised within the networks.
- A systematic analysis of needs, monitoring the implementation of the proposed measures and changes of trends in the region.

Availability:

- RIS LORIS 2030 is based on the potential of the region by promoting the development of skills rooted in the tradition and possible to use in a knowledge-based economy.
- The activities targeted to specific groups of entities consistently meeting the objectives stated in the RIS LORIS 2030.
- Using all opportunities associated with expanding innovative instruments for strengthening the region.
- The conducted innovation policy is adapted to specific functional areas and subregional centers of development in each subregion of the lodzkie region.

Partnership and public participation:

- Developing the skills of the entities in the region regarding innovative projects.
- Promoting opportunities to participate in the development of innovation policy in the region and partnerships with other entities of the innovation system, ready to assume part of the responsibility for raising the competitiveness and innovation in the region.
- Partners in innovation policy create an open, dynamic, learner-centred network, ready to take on new challenges, and coordinated by the Regional Government of the Lodzkie Region.

The innovations implemented within the RIS LORIS 2030 in the lodzkie region should be understood as:

INNOVATION - comes from the latin word “innovare” and means **“creating something new”.**

INNOVATION is the implementation of a new or a significantly improved product (good or service), or process, a new organisational method or a new marketing method in business practice, workplace organisation or the relationship with the environment. Products, processes, as well as organisational and marketing methods are not necessarily new to the market in which the company operates, but they must be new, at least for the company. Products, processes and methods do not need to be developed by the company itself, they can be developed by another company, or by a different entity (e.g. a research institute, research and development centre, university, etc.).[48]

Innovation that benefits the environment (eco-innovation) is defined as a new or significantly improved product (good or service), process, organisational or marketing method that brings environmental benefits when compared with the alternatives. Environmental benefits can be the primary objective of innovation or the result of other purposes, or may arise during the manufacturing of the product or service, or during the use of the purchased product or service by end users.[49]

Process innovations – implementation of new or significantly improved methods of production, distribution and promotion of activities regarding products and services. Methods of production are techniques, equipment and software used for the production (manufacture) of products or services. Delivery methods relate to the logistics of a company, and include hardware, software and techniques used to acquire the means of production, to allocate resources within the enterprise or supply the finished products. Process innovations include new or significantly improved methods for the creation and delivery of services. They can rely on significant changes in the hardware and software used for the service activity or changes in the procedures and techniques used to provide services. Process innovations also include new or significantly improved technology, equipment and software in ancillary activities, such as purchasing, accounting, IT support and maintenance.[50]

Product innovations – the launch of a product or service that is new or significantly improved within their properties or uses. This includes significant improvements in terms of technical specifications, components and materials, software, user-friendliness or other functional characteristics. Product innovation can be the result of the application of new knowledge or technology or new applications or a combination of existing knowledge and technology. Product innovations in services are based on the introduction of significant improvements in the way services are run, the addition of new functions or features to existing services and the introduction of completely new services.[51]

Marketing innovations - implementation of a new marketing concept or strategy that differs significantly from the marketing methods used so far in the company. This includes significant changes in the design / product design, packaging, distribution, promotion, product and price formation. It does not include seasonal changes, regular and other routine changes in marketing methods. New methods of marketing in the distribution of products depend primarily on the introduction of new sales channels. New marketing methods to promote products are based on the application of new ideas to promote products and services of the company. Innovations in the field

48 The definition used by GUS in statistical surveys for public statistics: http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-7060.htm

49 The definition used by GUS in statistical surveys for public statistics: http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-7061.htm

50 The definition used by GUS in statistical surveys for public statistics: http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-1479.htm

51 The definition used by GUS in statistical surveys for public statistics: http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-7059.htm

of pricing are based on the application of new pricing strategies for selling products and services of the company on the market.[52]

Organisational innovations - implementation of a new organisational method adopted by the company in terms of operation (including knowledge management), in the workplace and in their relations with the environment, which has not been used in the enterprise. Organisational innovations in the rules adopted by the company are based on the implementation of new methods of organising routine activities and procedures governing the work of the company. Innovations in workplace organisation involve the implementation of new methods for the allocation of tasks and decision-making power among employees. New methods of organisation in their relations with the environment depend on the implementation of new ways of organising relations with other companies or public institutions.[53]

52 The definition used by GUS in statistical surveys for public statistics: http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-6239.htm

53 The definition used by GUS in statistical surveys for public statistics: http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-206.htm

Chapter 5

System of priorities and strategic objectives for RIS LORIS 2030

The link between strategic and operational objectives

Description of Priority 1. Regional specialisation

Description of Priority 2. Development of the region's innovative potential

Description of Priority 3. Managing the region's innovations

Links between the objectives of RIS LORIS 2030 with other strategic documents

HUMAN CAPITAL
NATIONAL COHESION STRATEGY

Lodzkie Region

EUROPEAN UNION
EUROPEAN
SOCIAL FUND

5. System of priorities and strategic objectives for RIS LORIS 2030

5.1 The link between strategic and operational objectives

The strategic objectives, proposed for implementation within the RIS LORIS 2030, have been correlated with the needs identified in the diagnosis and the results of the SWOT analysis and stem from the need to include additional aspects arising from the generally applicable directions for development. On the one hand, support of the proposed targets for the endogenous potential of the region in the development of innovation in the region, and the barriers associated with the implementation of innovations, was critical. On the other hand, it is necessary to take into account the policy of the European Union, which requires that the regional specialisation („smart specialisation"), as an ex-ante condition for the Regional Operational Programme for the Lodzkie Region for the years 2014-2020, which is a major source of funding for innovative activities at the regional level.

The main barriers to the development of innovation, identified in the study, relate to the difficulties in defining what is meant by the term „INNOVATION", and the related limited awareness of the benefits resulting from the implementation of innovative projects. The big problem is the low level of mutual trust between entities operating in the region, as well as the insufficient level of information exchange between business environment institutions, universities and enterprises. A significant advantage of small and medium-sized businesses with a low potential for innovation exacerbates the situation – these businesses are characterised by the lowest awareness of the benefits of such cooperation. On the other hand, lack of orientation of the R&D sector to commercialise the results of research and collaboration with the business community, with simultaneous absence of clear and transparent rules for such cooperation, limits the extent of innovation in the region. As one of the main barriers, the entrepreneurs indicate a mismatch to their needs in both education programmes at all levels of education, as well as research in the region. Another limitation is the lack of clear assignment of responsibility to the institutions involved in the task of supporting the development of innovation and ongoing monitoring of the effects of their actions. Problems defined in the lodzkie region are largely the same as the problems identified in other Polish regions, and require the use of the basic tools of increasing awareness and knowledge in the field of innovation, among operators in the region, to a large extent.

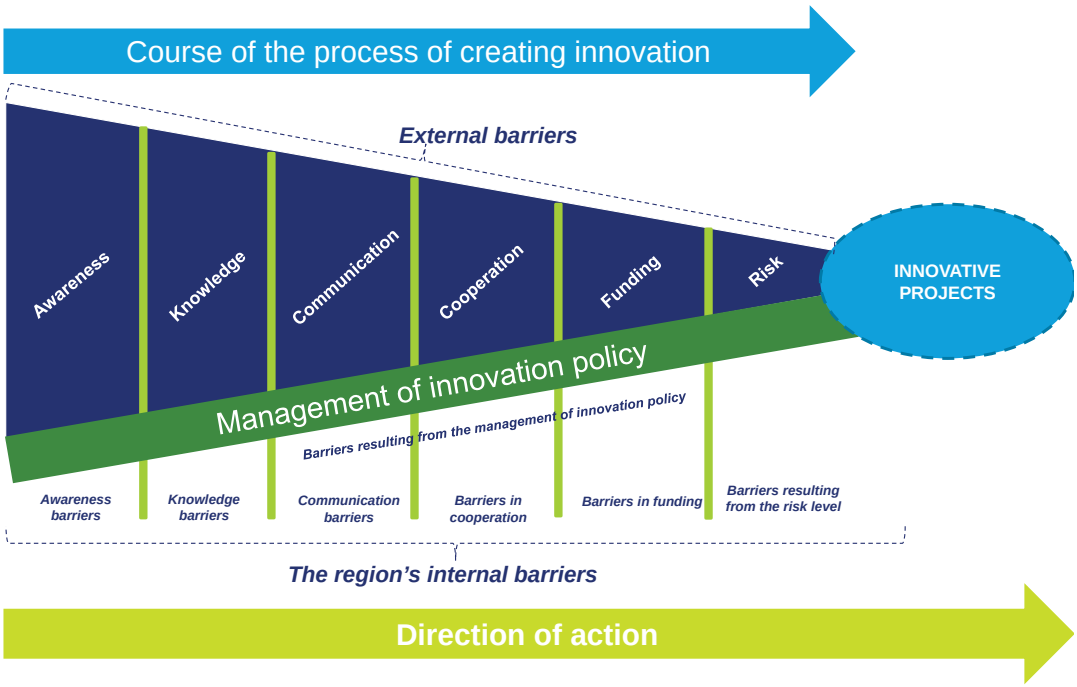
At the same time, the EU's development policy for 2014-2020 requires the indication of fields and industries, which will specialise in every region and which should be included in the development strategy of innovation. In practice, this means it is necessary to prepare a strategy of intelligent specialisation (the so-called „smart specialisation strategy"), which, as already mentioned, will condition the possibility of obtaining EU funds in the new financial perspective for this type of action. Regional specialisation should result from the widely understood potential of the region, which is both from the current economic output of the region, but also from the scientific and human potential, as well as what constitutes its specificity and uniqueness compared to other regions in the country and the European Union.

The basis for the development of operational objectives was to identify barriers in specific areas related to the implementation of innovation and the conduct of regional innovation policy. As a part of the analysis conducted in the course of the preparatory work, a list of the identified barriers for the development of innovation in the region has been developed, both within the voivodeship, as well as external barriers beyond the boundaries of the region, which the provincial government can influence to a limited extent, or that are not at all affected by it (e.g. tax laws relating to taxes other than local taxes). RIS LORIS 2030's key task is the removal of the barriers at the regional level, therefore, the proposed operational objectives

and related activities are associated primarily with obstacles identified at the regional level, that is, such, which regional authorities can realistically and directly influence. Nevertheless, the local government should not forget about reporting to the national government the initiatives to remove barriers under national laws and limits for innovation policies implemented at the national level (e.g. by being active in the Joint Commission of Government and Local Government for giving opinions regarding laws).

In view of the fact that the identified barriers to the implementation of the innovation can be linked to specific areas (awareness, knowledge, communication, cooperation, finance and risk), they have been properly classified by areas, which has allowed for the development of operational objectives and consequences of specific measures to achieve these objectives. The graph chart of this approach is shown in the figure below.

Figure 23. Barriers in the process of creating innovation



Source: Own study.

The proposed approach provides for the reduction of identified barriers to the implementation of innovation in the lodzkie region in relation to the different stages of the implementation of pro-innovation projects and activities. An essential factor for the removal of barriers to the implementation of innovation is to maintain a sequence of measures in accordance with the identified areas in which there are obstacles. It should be noted that without the awareness of entrepreneurs and research sector regarding the mutual benefits of their cooperation, as well as improved platforms of communication between these entities, there will be no possibility to use their potential to carry out joint research and development projects. However, even established and well-functioning co-operation will not produce the expected results in the absence of adequate knowledge, both in the entities referring it, as well as the institutions that should initiate and support such cooperation. That is why the proposed measure should be carried out in a defined sequence, shown above, i.e. using the so-called process approach. The issue of risk, due to the direct connection with the issue of financing has been incorporated into this particular area. The

use of a process approach, which assumes that certain measures in certain areas should be completed before action is taken in the following area (according to the sequence shown above), was the basis for determining the operational objectives and presenting a detailed action plans to the Regional Government of the Lodzkie Region. The main importance is the fact that the proper implementation of activities of a specific stage is a condition sine qua non for the success of the task in the next stage of the process.

The system of operational objectives has been prepared in relation to the three main priorities proposed for the RIS LORIS 2030, which are:

Priority 1. Regional specialisation - including key sectors, being the driving forces of development of the region.

Priority 2. Innovation potential development - including the widespread use of innovation in all areas and industries operating in the region, in addition to regional specialisation.

Priority 3. Innovation management in the region - including improving the effectiveness of innovation policy in the region and creation of conditions for the development of innovation in the regio**n.**

Table 25. The system of priorities and operational objectives for RIS LORIS 2030

AREA OF PROCESS	*AWARENESS*	*KNOWLEDGE*	*COMMUNICATION*	*COOPERATION*	*FUNDING*
STRATEGIC OBJECTIVES	**Operational objectives**				
PRIORITY 1. REGIONAL SPECIALISATION	**The objective: Building a competitive advantage – the driving force of economic development, which will be a hallmark of the region**				
	1.1. Building awareness of regional specialisation	1.2. Construction of the intellectual potential of regional specialisation	1.3. Improving communication in the area of regional specialisation	1.4. Improving communication in the area of regional specialisation	1.5. Support for cooperation projects within clusters and areas of specialisation
PRIORITY 2. THE REGION'S INNOVATION POTENTIAL DEVELOPMENT	**The objective: The use of the internal potential of the region to improve the innovation of the economy**				
	2.1. Raising awareness of the benefits of innovation	2.2. Promotion of knowledge about innovation and entrepreneurship	2.3. Platforms for the exchange of experiences and communication	2.4. Promotion of collaboration and cooperation of economic entities	2.5. Funding of the development of regional innovation potential
PRIORITY 3. INNOVATION MANAGEMENT IN THE REGION	**The objective: Improving the innovations management in the region**				
	3.1. Building awareness within the environment that supports the implementation of innovations	3.2. Construction of an innovation management system	3.3. Creation of a system of communication and counselling	3.4. Building the framework of a system encouraging cooperation and entrepreneurship	3.5. Construction of a system of financing innovation

Source: Own study.

The system of the operational objectives has been related to the various stages of the process of creating innovation such as: awareness, knowledge, communication, collaboration and funding, to ensure alignment of appropriate actions on the following stages and indicate their sequence in the implementation of RIS LORIS 2030.

5.2 Description of Priority 1. Regional specialisation

The justification for the implementation of Priority 1. Regional specialisation

The challenges related to the globalisation of the economy that the Member States and the different regions are facing require the determining of the direction of efforts and resources in selected areas and industries, in which different regions will specialise in, allowing proper allocation of public support in order to develop the most promising sectors of the economy. Regional specialisation should result from the potential of the region, and should become a driving force in the future, leading its development. Given the general trends of development in the world, the most desirable route for lodzkie region's economy is a strong and consistent policy for the development of new technologies and innovation in every sphere of life, but especially in areas with the greatest potential for the development of the region. Entities that have high growth potential due to the ready market, access to qualified personnel and technologically adequate equipment, must function in the designated areas.

In the lodzkie region, the potential of individual sectors has been carefully analysed in the preparation of the update to the Development Strategy for the Lodzkie Region 2020. As a result of further evaluation of the potential of the industries, mentioned in the above document, for their development and scientific potential available in the lodzkie region, those that have particular potential for innovation and can become the driving forces of regional growth, have been selected. These are:

- Medical industry, pharmaceuticals and cosmetics (including health resort medicine);
- Energy (including EE, RES);
- Modern textile and fashion industry (including design);
- Advanced construction materials (including design);
- Innovative agriculture and agri-food industry;
- IT and telecommunications.

Entities operating in the areas of specialisation of the region will be able to obtain support from the European Union funds of the future financial perspective (2014-2020), available under the Regional Operational Programme for the years 2014-2020.

For the selected industries, the following priority areas of technology and skills for the lodzkie region have also been identified:

- Biotechnology;
- Mechatronics;
- Nanotechnology and functional materials;
- Communication and Information Technology.

The identified technologies are to support the development of economic sectors included in the regional specialisation of the region. As a part of the support granted in Priority 1, projects regarding issues located at the interface between industry and technology will be preferred. In the future, the emergence of new industries and technologies that can extend the above directory is also possible, or the modification of the current directory depending on the effects of the implementation of RIS LORIS 2030. It is important to monitor the development of industries that currently have the greatest potential for development, i.e. industries such as, BPO, logistics and engineering and electromechanical engineering and furniture, and have the potential to generate sufficient critical mass in the future to take over the role of the driving force of the region's development. It was also noted that, due to demographic changes in the region, an

important role in the future may also be played by the so-called silver economy.[54] Monitoring should also include future directions of technology development in the region.

A particular innovation potential of the industries and technologies indicated above stems from to the simultaneous presence of research opportunities, the possibility of tertiary education and vocational education, the existence of an educated internal market, the potential of companies and the potential of partners for cooperation, in the region.

The objective of Priority 1. Regional specialisation

The strategic objective under this priority is to build a competitive advantage – driving forces of economic development, characteristic of the lodzkie region. The region should create favourable conditions for the development of selected specialisation and seek innovation, **enhance the transfer of technology, conduct research and development works in selected areas of specialisation, not only at the level of the voivodeship and the country, but also to support their development through creating clusters and networking, also with other regions within the country and Europe**. The networks should involve research centres, entrepreneurs, institutions supporting the development of entrepreneurship and regional authorities.

Under this Priority, support will be directed to measures dealing with strengthening the strategic industries of the region, including: the improvement of awareness, knowledge and skills of both companies and their groups, including clusters operating within the areas of specialisation, as well as entities supporting their development, such as research entities, business environment institutions, education at all levels and other entities performing tasks on behalf of the specialisation of the region. The activities carried out in this area will also have to improve the communication and information flow, and increase collaboration and technology transfer between science and business in the area of specialisation, both within the region, but even at the inter-regional and international levels.

- **Operational objectives for the implementation of the Priority 1. Regional specialisation**

Within *Priority 1 Regional specialisation*, five operational objectives regarding the various stages of the process of creating innovation will be performed, within which 15 measures have been identified:

- **Operational objective 1.1. Building awareness of regional specialisation**

The objective will be achieved through the implementation of the following measures:

  - Measure 1.1.1. Integration of key industries in the area
  - Measure 1.1.2. Experience exchange programmes at the national and international level
  - Measure 1.1.3. Promotion of key industries

- **Operational objective 1.2. Construction of the intellectual potential of regional specialisation**

The objective will be achieved through the implementation of the following measures:

  - Measure 1.2.1. Training programmes for regional specialisation
  - Measure 1.2.2. Staff exchange programmes between science and business within the areas of specialisation

54 Silver economy - an economic system aimed at exploiting the potential of older people and taking into account their needs. Source: SEN @ ER - Silver Economy Network of European Regions.

- Measure 1.2.3. Development of vocational and technical education to the needs of the region's specialisations
- Measure 1.2.4. Support for the training and consulting needs of business for the needs of the region's specialisation

- **Operational objective 1.3. Improving communication in the area of regional specialisation**

The objective will be achieved through the implementation of the following measures:

- Measure 1.3.1. Preparation of the offers for cooperation between science and business
- Measure 1.3.2. Supporting efforts of mutual communication within the specialisation
- Measure 1.3.3. Dedicated training and brokerage meetings within the specialisation

- **Operational objective 1.4. Support for cooperation projects within clusters and areas of specialisation**

The objective will be achieved through the implementation of the following measures:

- Measure 1.4.1. Establishing clear rules for cooperation
- Measure 1.4.2. Realising research and development projects within the regional specialisation
- Measure 1.4.3. Support for the process of technology transfer from science to business
- Measure 1.4.4. Cooperation, including interregional and international cooperation

- **Operational objective 1.5. Providing of a financing system of projects aimed at regional specialisation**

The objective will be achieved through the implementation of the following measures:

- Measure 1.5.1. Financial support for projects within the regional specialisation

Results of Priority 1. Regional specialisation

The result of the implementation of individual measures, and consequently the operational objectives within the priority will be **building a competitive advantage – driving forces of economic development, which will become the hallmark of the lodzkie region** by:

- **Building awareness and potential for the development of specialisation** by: grouping entities within the cooperation networks[55] the appointment of coordinators for the different key industries in the region and raising the awareness of entities operating in the areas of key industries in the field of innovation policy, pursued in the region, identifying possible areas of cooperation for the individual entities operating in areas of key industries, preparing guidelines for the implementation of joint projects. The result of the implementation of specific tasks will also be the implementation of experience exchange and joint research projects with partners at national and international levels, as well as building awareness for the promotion of specialisation of the region, in particular through the promotion of key industries and areas of specialisation in trade fairs, trade missions, etc., organized at the national and international level.

55 The cooperation network in this case should be understood as a network of entities who are willing to cooperate in the activities undertaken or supported by the co-ordinator designated for a given key industry.

- **Providing an appropriate level of knowledge and qualifications and access to human capital in the area of specialisation of the region** by: developing educational programmes in the area of specialisation of the region, based on the needs of entrepreneurs, both at the level of tertiary education and technical and vocational training, as well as by carrying out the exchange of personnel between universities and businesses in the areas of particular importance for the development of regional specialisation, and by supporting the development of vocational and technical training for specific companies in key industries, as well as providing expert advice and training operators in the areas of specialisation.
- **Improving communication and information exchange within the areas of specialisation** by: preparing a detailed offer of cooperation and providing quick access to information on the available offers of research entities and indicating potential areas in which it will be possible to cooperate in the field of research and development for entrepreneurs, in addition to providing the tools necessary to build an effective system of information flow, i.e. a plan of communication and information flow, along with indicating the responsibility for communication in different institutions, using the Lodz Knowledge Transfer Platform, the organisation of regular, thematic meetings in areas of specialisation, creating a platform for communication between those offering and seeking technology from industries / key specialisations, and facilitating the establishment of key business relationships between entrepreneurs, as well as scientific and research entities at regional, national and international level.
- **Intensification of cooperation between enterprises and research entities in the areas of specialisation** by establishing clear rules for cooperation, supporting research projects and the development of regional specialisation, supporting the process of technology transfer from science to business, as well as regional and international cooperation.
- **Financial support for projects of regional specialisation,** including integrated financing instruments, tailored to fund innovative projects within the specialisation, including both the purchase of services and investment support, for example: investment projects, purchase and transfer of technology, the purchase of intellectual property, implementation of key research projects, opening R&D departments in companies, as well as ensuring financial instruments for areas that are to take part in *Priority 1. Regional specialisation.*

5.3 Description of Priority 2. Development of the region's innovative potential

The justification for the implementation of Priority 2. Development of the region's innovative potential

The justification for the implementation of the Priority is on the one hand the need to exploit the potential of micro, small and medium-sized enterprises, which are present in the region outside the areas of key industries covered by the support within *Priority 1. Regional specialisation*; on the other hand, reducing barriers to the development of innovation identified in the region, to ensure its consistency in both economic and social terms. Key barriers that should be overcome are: low awareness of stakeholders and residents of the region of issues of innovation and its importance for the development of most business initiatives, regardless of their size, and the limited knowledge and competence in the ability to identify the benefits of implementing both innovative projects and those carried out in collaboration with research entities, also a low level of mutual trust between entities operating in the region, as well as the inefficient system of information exchange between business institutions, universities and businesses. A significant limitation in the development of innovation is also the lack of industry-oriented R&D (research and development) to commercialise the results of research and collaboration with businesses, as well as the mismatch between the needs of the latter and both

the education programmes at all levels of education, as well as directions of research undertaken and carried out in the region.

An important issue is referencing the extent and characteristics of the interventions made in Priority 2 to the functional areas (with the exception of three functional areas supported under the key industries identified under Priority 1) that have been identified in the region and indicated in the Development Strategy for the Lodzkie Region 2020. Identified areas that formed naturally due to their spatial characteristics, potential endogenous concentration and development of specialised economic functions, should be centres of growth of the competitiveness of the region, based on existing and emerging functional relationships within them. These are:

- Lodz Metropolitan Area;
- Tourism Areas of the River Valleys of Pilica, Warta and Bzura.

In addition, under Priority 2 apart from the growth centers in the above mentioned functional areas, support should be directed to the development of subregional growth centers, within which entities operate in all other areas of industry, interested in innovation, that is relevant entities, their associations, and research and educational institutions, government and innovative business environment institutions, in selected subregions of the lodzkie region, i.e.: north, east, west, central.

A more dynamic development of functional areas and each subregion should be conducted by increasing the innovation of the companies that operate there, as well as the creation of R&D centres and building and development of cooperation networks within them.

The objective of Priority 2. Development of the region's innovative potential

The strategic objective under this Priority is the use of internal potentials of the region to improve the innovation of the economy of the lodzkie region. Support in this area is aimed at the development of innovation in a wide range, regardless of the industry in which a given company operates, among others, **by supporting product innovation, process innovation, organisational**, **marketing and eco-innovation at all levels of their range, i.e. local, regional, national and international level.**

Under this Priority, support will be allocated to activities related to awareness, knowledge and skills related to the widely understood innovation and entrepreneurship, including the adaptation of curricula to this subject, as well as providing dedicated advice and training for operators in selected functional areas and subregional growth centers of the lodzkie region, and promotion of regional innovation, both internal and external. The activities carried out in this area will also aim to improve communication and information flow, and to increase collaboration and technology transfer between science and business, especially when it comes to SMEs, and the development of academic entrepreneurship.

Operational objectives for the implementation of the Priority 2. Development of the region's innovative potential

Within *Priority 2. Development of the region's innovative potential*, five operational objectives for the various stages of the process of creating innovation will be carried out, within which 12 measures have been identified:

- **Operational objective 2.1. Raising awareness of the benefits of innovation**

The objective will be achieved through the implementation of the following measures:

- Measure 2.1.1. Shaping the attitudes of pro-innovative entrepreneurs, especially in the SME sector
- Measure 2.1.2. Promotion of regional innovation

- **Operational objective 2.2. Promotion of knowledge about innovation and entrepreneurship**

The objective will be achieved through the implementation of the following measures:

- Measure 2.2.1. Curricula that promote innovation and entrepreneurship at all levels of education
- Measure 2.2.2. Promotion of eco-innovation
- Measure 2.2.3. Consulting and training activities to promote innovation
- Measure 2.2.4. Staff exchange programmes between universities and business to promote innovation

- **Operational objective 2.3. Platforms for the exchange of experiences and communication**

The objective will be achieved through the implementation of the following measures:

- Measure 2.3.1. Supporting mechanisms of exchange of information and communication
- Measure 2.3.2. Dedicated brokerage training meetings for the development of innovation potential
- Measure 2.3.3. Activation of entrepreneurship in academia

- **Operational objective 2.4. Promotion of collaboration and cooperation of economic entities**

The objective will be achieved through the implementation of the following measures:

- Measure 2.4.1. Supporting the establishment of cooperation and cooperation networking
- Measure 2.4.2. Supporting research and development projects carried out in cooperation between the academic and business spheres

- **Operational objective 2.5. Providing a financing system of the development of regional innovation potential**

The objective will be achieved through the implementation of the following measures:

- Measure 2.5.1. Financial support for the development of projects regarding the innovative potential of the region

Results of Priority 2. Development of the region's innovative potential

The result of the implementation of individual measures, and consequently the operational objectives within the priority will be the **development of the innovation potential and improving the competitiveness of the Lodzkie Region** by:

- **Raising awareness about the benefits of innovation** resulting from: taking action on shaping pro-innovation attitudes of entrepreneurs, especially in the SME sector, and the promotion of innovation within the region's cyclical, annual exhibition of innovation in the region, as well as the organisation of competitions for the most innovative companies, promoting the idea of innovation at every stage of education, and contacts and lectures organised with the creators of innovation, organisation of competitions for young people and students, innovative projects in the region for financial awards for projects presented in the competitions.

- **Dissemination of knowledge on innovation and entrepreneurship in the region** with staff exchange programmes between science and business to promote innovation, curricula disseminating knowledge of innovation and entrepreneurship at all levels of education, activities promoting and raising awareness of the importance of eco-innovation and bio-economy in the region, counselling and training to promote innovation, including vouchers for consulting, training, auditing firms, and innovation in providing comprehensive and specialised services to SMEs.
- **Stimulation of exchange of experience and communication,** particularly with regard to the defined functional areas by: preparing a specialised platform, designed to support innovation and the transfer of knowledge and technology in the functional areas of the lodzkie region, using the Lodz Knowledge Transfer Platform, as an interactive tool to support the flow of information and communication between entities in the functional areas, as well as the organisation of meetings dedicated to training and enabling brokers to establish cooperation with those offering and seeking technology innovation, fostering the development of entrepreneurship in the academic environment and stimulating and supporting the development of innovative academic entrepreneurship.
- **Undertaking collaboration and cooperation between economic entities** as a result of: promoting and supporting the establishment of cooperative relations in the region, supporting the creation of clusters and cooperation networks, as well as within the implementation of R&D projects in cooperation of the businesses sector with the science sector, that will be closely tailored to the needs of SMEs, and further development of R&D infrastructure.
- **Financial support for projects concerning the development of the innovation potential** of the region in relation to: providing access to funding of innovative projects in terms of product, process, organisation or marketing, both at the local, regional, as well as national and international level. In addition, financing of environmental investments, as well as the wider the development of academic entrepreneurship and innovation including, among others, supporting the economic activities of start-ups, spin-offs, etc. and promoting the use of ICT tools as well as providing other financial instruments for the other support areas mentioned in the *Priority 2. Development of the region's innovative potential.*

5.4 Description of Priority 3. Managing the region's innovations

The justification for the implementation of Priority 3. Managing the region's innovations

Shaping the socio-economic environment conducive to undertaking innovation activities is essential for economic development. The low level of competence of the local government on the importance of innovation for the development of the region, as well as the insufficient level of qualification of representatives of business environment institutions and other entities operating in the area, the main barriers to innovation in the area indicated by the entrepreneurs. An additional difficulty, limiting the development of innovation in the lodzkie region is the lack of a coherent vision for the development of this area and effective instruments of implementation of the RIS LORIS 2030, as well as a clear attribution of responsibility to the relevant institutions and monitoring the effects of activities carried out by them. Significant barriers are also: non-efficient allocation of EU funds for innovation, bureaucratisation and formalisation in the financing of projects in this area, and the lack of continuity in financing of projects, i.e. from basic research to implementation, including funding gaps, especially with regard to small and medium-sized enterprises. To ensure high performance implementation of the regional policy of pro-innovation, the above barriers should be limited and conditions for fostering the development of entrepreneurship and innovation should be created, and tools for the effective implementation of the Regional Innovation Strategy for the Lodzkie Region „LORIS 2030" should be prepared.

The objective of Priority 3. Managing the region's innovations

The strategic objective under this Priority is to improve the management of innovation in the region. This requires on the one hand the preparation of institutional and organisational structures, tools and instruments to support the consistent implementation of the initiatives defined in the other two priorities. On the other hand, it is necessary to create awareness about the importance of innovation for the development of the region and the expansion of knowledge in this field among all entities operating in the Lodzkie Region, especially those that need to carry out activities in support of pro-innovation, that is, local governments, social-economic partners, the education sector and business environment institutions.

As a part of this Priority, support will be allocated to activities related to the provision of access to information and counselling, as well as streamlining the communication process in the Regional Innovation System through the establishment of a sustainable institutional system to implement RIS LORIS 2030, including entities responsible for the network of contacts with companies in selected areas, providing access to a comprehensive and current information on the activities carried out by individual entities operating in the Regional Innovation System, including the system ordering research, as well as creating a platform for cooperation between institutions to support innovation and coordination of their undertaken activities. Instruments will also be supported: encouraging entrepreneurship, especially academic cooperation activities stimulating SMEs and the science sector, the activities contributing to the development of clusters in the region and the influx of innovative investment, and the development of information society services, both in terms of modern infrastructure and services and products in the digital economy.

Opertional objectives for the implementation of Priority 3. Managing the region's innovations

Within *Priority 3. Managing the region's innovations*, 5 operational objectives regarding the various stages of the process of creating innovation will be carried out, within which 14 measures have been identified:

- **Operational objective 3.1. Building awareness within the environment that supports the implementation of innovations**

The objective will be achieved through the implementation of the following measures:

  - Measure 3.1.1. Improving the knowledge and awareness of pro-innovation in the local administration
  - Measure 3.1.2. Developing an innovation culture and a wider engagement of the society in the process of innovation

- **Operational objective 3.2. Construction of an innovation management system**

The objective will be achieved through the implementation of the following measures:

  - Measure 3.2.1. Ensuring efficient management mechanisms, implementation, monitoring and evaluation of RIS LORIS 2030
  - Measure 3.2.2. Raising the skills of human capital in the innovation system

- **Operational objective 3.3. Creation of a system of communication and counselling**

The objective will be achieved through the implementation of the following measures:

- Measure 3.3.1. Building a support system of communication and counselling
- Measure 3.3.2. Platform for the exchange / transfer of knowledge / innovation
- Measure 3.3.3. Creating a system of ordering and collecting information on the results of research
- Measure 3.3.4. A platform for cooperation between institutions in support of innovation

- **Operational objective 3.4. Building the framework of a system encouraging cooperation and entrepreneurship**

The objective will be achieved through the implementation of the following measures:

- Measure 3.4.1. Supporting the system to stimulate entrepreneurship
- Measure 3.4.2. Establishing a system of technology brokers
- Measure 3.4.3. Building a system for cluster policy
- Measure 3.4.4. Supporting innovative investment inflows
- Measure 3.4.5. Developing information society services

- **Operational objective 3.5. Providing of an integrated system of financing innovation**

The objective will be achieved through the implementation of the following measure:

- Measure 3.5.1. Creating a system of financing innovation in the region.

Results of Priority 3. Managing the region's innovations

The result of the implementation of individual measures, and consequently the operational objectives within the priority will be to **improve innovation management in the region** by:

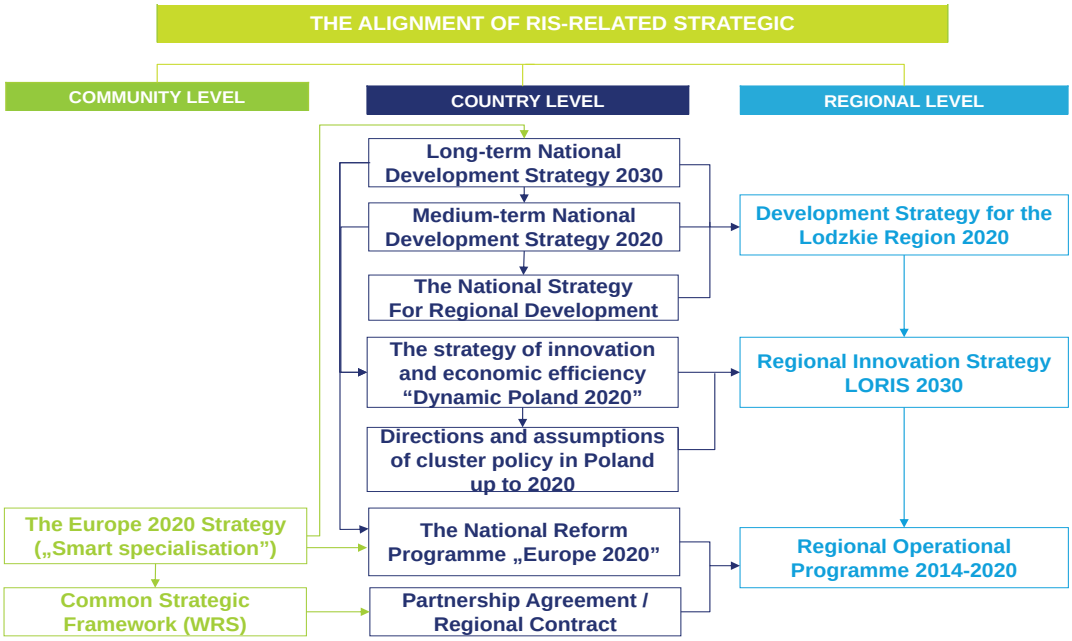
- **Raising awareness about the benefits of innovation an environment that supports innovation** through: the implementation of innovation: realising education programmes of pro-innovation among employees of local government institutions at regional and local levels in order to promote good practices and knowledge about effective measures to improve innovation undertaken by the administration in other regions of the country and Europe, as well as study visits, seminars, exchange of experiences and acquiring knowledge about available support instruments of information and promotional activities, and the implementation of projects aimed at the dissemination of positive examples of the success of innovative projects, including the co-operation between individuals, social organisations and local governments, and through the inclusion of a wider public in the creation of innovative policies at regional and local levels, as well as delegating some powers and responsibilities of the social partners in local government, including non-governmental organizations.
- **The creation of a stable system of innovation management** by: creating a permanent organisational structure together with a division of responsibility for the different stages of implementation of the Strategy between the selected institutions in the Lodzkie Region, coordinating and monitoring the implementation of the strategic and operational objectives of RIS LORIS 2030, and evaluation of the implementation of selected activities, and providing increased knowledge and qualifications of personnel involved in the implementation of RIS LORIS 2030.

- **The creation of a comprehensive system of communication and counselling** through: the establishment of a network of entities responsible for direct contact with companies in the area of innovation, that is a network of 22 business environment institutions available in each county, a network of regional specialisation coordinators and a network of Technology Transfer Centres in the region, to ensure the maintenance and development of the Lodz Knowledge Transfer Platform, creating a system of ordering and collecting information on the results of research carried out in universities located in the region and offering information on their offer regarding research and development for the companies, as well as a platform for cooperation between institutions that support innovation, and coordination of measures, in order to provide better communication and information flow between the institutions involved in the implementation of RIS LORIS 2030.
- **The creation of a system to encourage cooperation as** a result of taking action: supporting the development of entrepreneurship through business incubation programmes, the development of services for business development, including projects related to the development of the necessary infrastructure, creating a system of technology brokers - a system of qualified staff and experts activating the cooperation of the science and business sectors, and supporting the establishment of partnerships between providers and consumers of new technological solutions, designing and implementing comprehensive regional cluster policy, an integrated support system for foreign investors, as well as developing infrastructure and information society services.
- **Providing an integrated system of financing innovation** in relation to the provision of financing of innovative projects at various stages of their development, including the use of external sources of finance, promoting and disseminating knowledge of the specificities of different financial instruments, to adapting the sources to the type of projects, depending on the rate of return, as well as providing financial support for the implementation of the tasks set out in *Priority 3. Managing the region's innovation***.**

5.5 Links between the objectives of RIS LORIS 2030 with other strategic documents

Both the strategic and operational objectives proposed in the Regional Innovation Strategy for the Lodzkie Region – "LORIS 2030" are consistent with the strategic documents at the national level and the European Union. The system of strategic documents of the Regional Innovation Strategy for the Lodzkie Region – "LORIS 2030", which have a direct impact on the scope of the objectives to be realised, is presented below.

Figure 24. The system of strategic documents related to the implementation of the RIS LORIS 2030



Source: Own study.

At the community level, the basic strategic document which sets the direction for the countries of the European Union is the Europe 2020 Strategy. The EU strategy in this document has been determined for regional specialisation and sustainable development, and providing for social inclusion. The objectives of the five main areas that are to be achieved by 2020 have been pointed out within this document.

Figure 25. Strategic documents at the European Union level

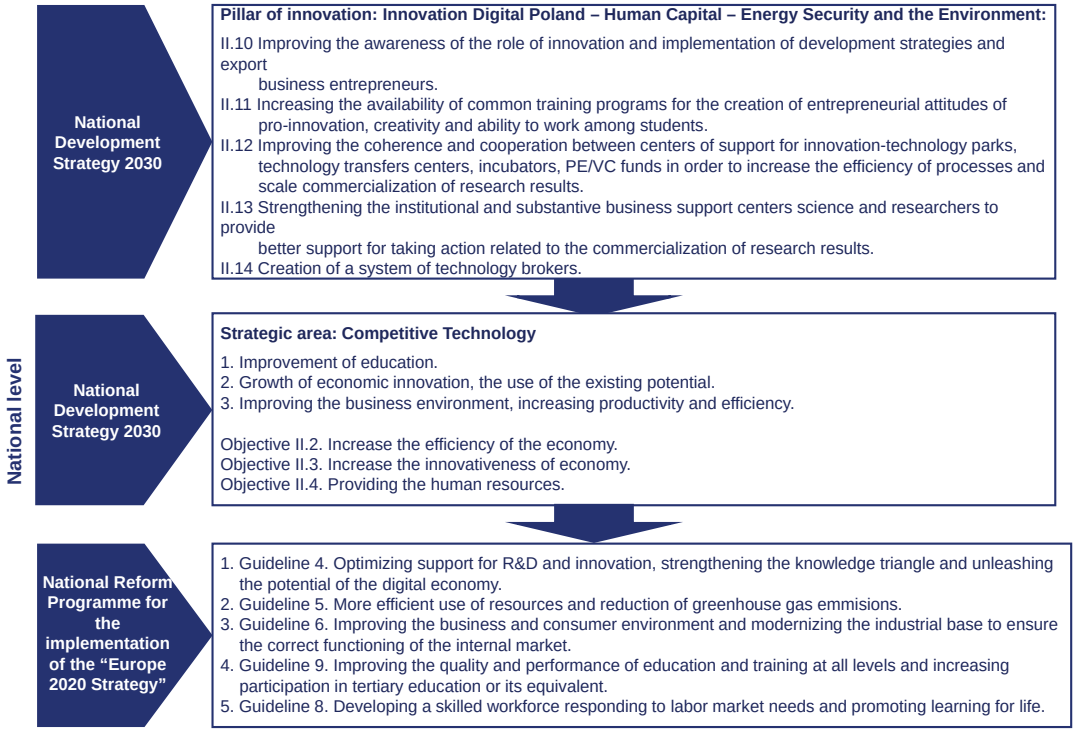
Source: Own study.

To ensure the effective implementation of the objectives set out in the Europe 2020 Strategy, they have been clarified in the Common Strategic Framework, a document indicating the main areas of EU spending in 2014-2020, which will have a direct impact on the programme spending at the level of Member States. Based on the trends identified in this document, the provisions of the "Partnership Agreement" will be prepared, which will include, among other things, the key trends of intervention and a thematic focus on intervention division between the country and the region. From the 11 objectives, created to carry out in the Common Strategic Framework, from the point of view of RIS LORIS 2030, the key objectives include:

- supporting research, technological development and innovation,
- increasing the availability, use and quality of information and communication technologies,
- improving the competitiveness of small and medium-sized enterprises, the agricultural sector (regarding the EAFRD) and fisheries and aquaculture sector (regarding the EMFF),
- supporting the transition to a low carbon economy in all sectors,
- protecting the environment and promoting resource efficiency,
- investing in education and learning for life,
- strengthening the institutional and administrative efficiency.

Meanwhile, at the national level, the basic strategic document, which sets the direction of development for Poland up to 2030, is the Long-Term National Development Strategy, which sets the National Development Strategy 2020 and other strategies prepared in selected thematic areas, including, the key in terms of the Regional Innovation Strategy for the Lodzkie Region LORIS 2030 - the Strategy of Innovation and Economic Efficiency even in a non-approved project form. An equally important document is the National Reform Programme for the implementation of the "Europe 2020" strategy, prepared at the national level in response to the Europe 2020 Strategy. The main objectives that should be included in the Regional Innovation Strategy for the Lodzkie Region LORIS 2030 are presented below.

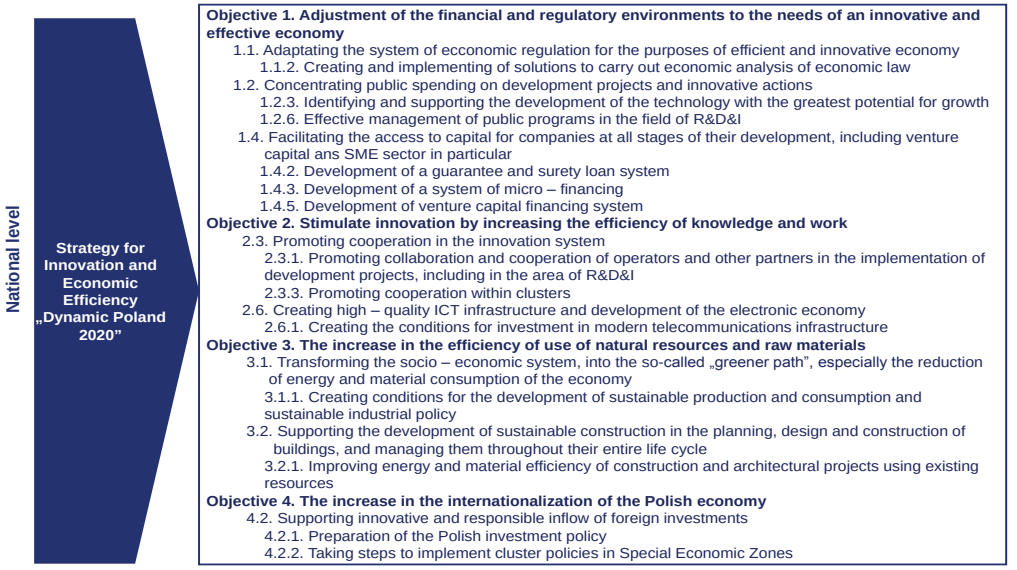
Figure 26. Strategic documents at the national level



Source: Own study.

As it has already been mentioned, the records of the Strategy of Innovation and Economic Efficiency "Dynamic Poland 2020" project are particularly important for the preparation of the RIS LORIS 2030. This document should almost entirely be addressed at the regional level. The figure below shows key objectives that have been assigned to local governments of voivodeships in the draft of the Strategy, as key to achieve in the coming years.

Figure 27. Objectives relevant to the RIS LORIS 2030, as pointed out in the draft of the Strategy for Innovation and Economic Efficiency "Dynamic Poland 2020"



Source: Own study.

At the regional level, the most important strategic document that defines the directions of the development of the lodzkie region is the Development Strategy for the Lodzkie Region 2020 (LVDS). Regarding its update that is being developed, there is a need to refer to the main directions, set out in the document, key in terms of the RIS LORIS 2030, as shown in the following figure. LVDS is a crucial and fundamental strategic document pointing out the areas of development of the region, for which RIS LORIS 2030 will be a refinement in the area of development of innovation in the region.

Figure 28. Objectives relevant to the RIS LORIS 2030, as pointed out in the draft of the Development Strategy for the Lodzkie Region 2020

Source: Own study.

A matrix of complementarity of the RIS LORIS 2030 with the strategic documents at the regional, national and European levels is presented in the table below.

Table 26. Complementarity of the RIS LORIS 2030 with the strategic documents at regional, national and European levels

Regional Innovation Strategy LORIS 2030

Strategic documents		Priority 1. Regional specialisation					Priority 2. The region's innovation potential development					Priority 3. Innovation management in the region				
		01	02	03	04	05	01	02	03	04	05	01	02	03	04	05
Level of cooperation	Europe 2020 Strategy															
	Objective 1.	■	■	■	■	■	■	■	■	■	■					
	Objective 2				■	■		■		■	■					
	Objective 3.					■					■	■	■			■
	Common Strategic Framework															
	Objective (1)				■	■				■	■					■
	Objective (2)					■		■			■				■	■
	Objective (3)	■	■	■	■	■					■					■
	Objective (4)					■					■					■
	Objective (6)					■		■			■					■
	Objective (10)		■						■							
	Objective (11)											■	■	■	■	■
Country level	Long-term National Development Strategy															
	Objectives II.10	■	■	■			■	■	■							
	Objectives II.11		■					■								
	Objectives II.12													■	■	
	Objectives II.13				■	■				■	■				■	
	Objectives II.14														■	
	National Development Strategy 2020															
	Objective 1.	■						■								
	Objective 2	■	■	■	■	■		■	■	■	■					
	Objective 3.				■	■				■	■					
	Innovation and Economy Effectiveness Strategy „Dynamiczna Polska 2020"															
	Objective 1.					■					■					■
	Objective 2			■	■	■			■	■	■			■	■	■
	Objective 3.					■			■		■					
	Objective 4.				■										■	

Strategic Documents		Priority 1. Regional specialisation					Priority 2. The region's innovation potential development					Priority 3. Innovation management in the region				
		01	02	03	04	05	01	02	03	04	05	01	02	03	04	05
Regional level	Development Strategy for the Lodzkie Region 2020															
	Objective 1	■	■	■	■	■										■
	Objective 2		■					■					■			
	Objective 3						■	■	■	■	■					■
	Objective 4											■				
	Objective 5														■	
	Objective 7														■	
	Objective 9			■	■				■	■					■	

Source: Own study.

01, 02, 03, 04, 05 - the operational objectives pointed out for implementation under each priority of RIS LORIS 2030 (presented in **Table 27. The system of priorities and operational objectives for RIS LORIS 2030)**.

Chapter 6

Innovation policy (Action Plan)

System of activities within the defined operational objectives

HUMAN CAPITAL
NATIONAL COHESION STRATEGY

Lodzkie Region

EUROPEAN UNION
EUROPEAN
SOCIAL FUND

6. Innovation policy (Action Plan)

6.1 System of activities within the defined operational objectives

Another element in the development of operational objectives was to identify measures to ensure their achievement in the future. In order to ensure the effectiveness and efficiency of the proposed measures and the implementation of concrete measures of support, it is necessary to adapt their range to the needs and possibilities of the main groups of entities, who are to be recipients of the prepared measures. Therefore, measures to be implemented within individual operational objectives are aligned to the recipients of support in three defined key areas, namely:

1. Regional specialisation – of companies and their groups that will constitute the driving forces of development, and entities supporting the development of their activities in the areas of specialisation.

2. Innovation potential – the widespread use of the broadly defined innovation - businesses and individuals and entities outside the areas of specialisation, to support activities raising competitiveness and innovation in the region.

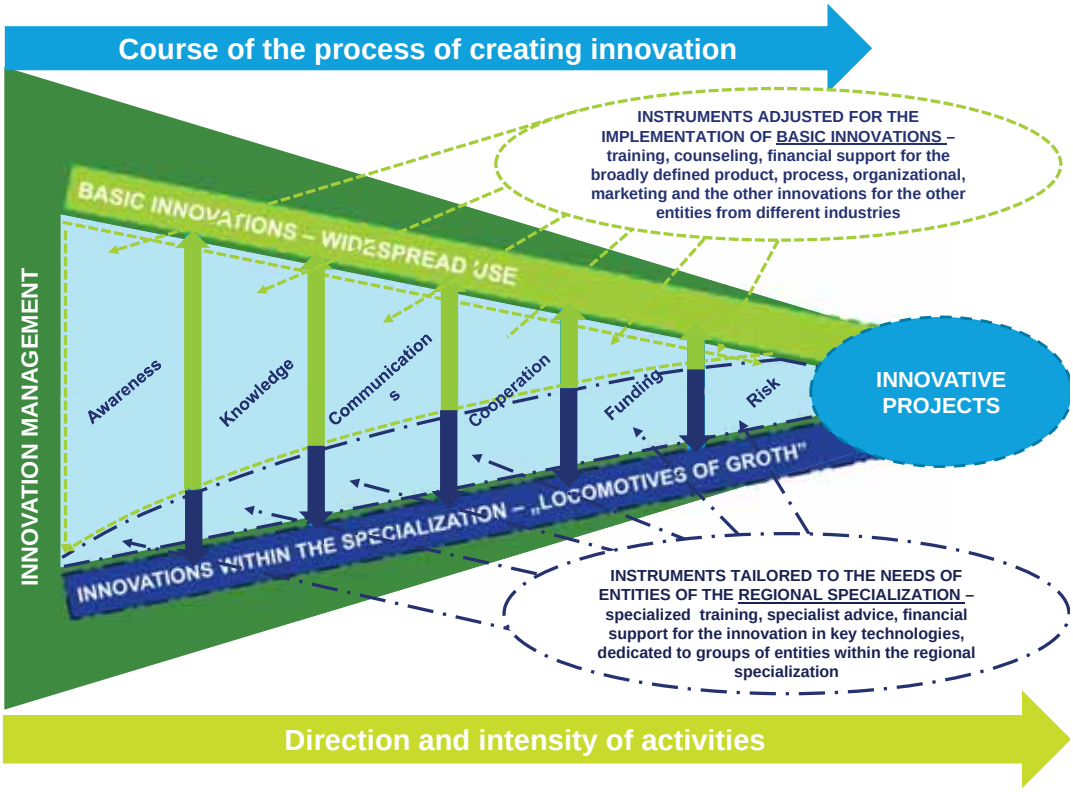
3. Innovation management in the region – entities and structures creating the conditions for innovation and ensuring support during the implementation phase of innovative projects.

The figure below shows the direction of support and the intensity of conducting individual activities within the priority areas.

In the case of regional specialisation, the measures must be strictly dedicated to the needs and specialisation of entities operating in those areas, whereas in the case of basic innovations, they should include, first of all, all the instruments in the field of building awareness, knowledge and improving the competitiveness of SMEs.

Thus prepared activities within the particular priorities and operational objectives for the RIS LORIS 2030 are designated to – on the one hand – make use of the economic and technological potential of the lodzkie region by focusing on selected specialisations („driving forces of growth"), on the other – to support the development of innovation in a broad range, regardless of the industry in which the company operates (e.g. by supporting product, process, organisational and marketing innovations). At the same time, the approach adopted provides for the peculiarities of specific customers and indicates the direction of measures, while allowing for the preparation of a precise timetable for their implementation.

Figure 29. Adaptation of the activities for the priority areas defined for the RIS LORIS 2030



6.1.1 Priority 1. Regional Specialisation

Within *Priority 1. Regional specialisation*, 5 operational objectives, and 15 measures within those objectives, have been selected for implementation.

Table 27. The list of operational objectives and activities within *Priority 1. Regional specialisation*

AREA	AWARENESS	KNOWLEDGE	COMMUNICATION	COOPERATION	FUNDING
Priority 1. Regional specialisation **The main beneficiaries: companies in key sectors and clusters, universities, technical and vocational schools educating for the purposes of industries**	**1.1.** Building awareness of regional specialisation **Measures:** **1.1.1.** Integration in the area of key industries **1.1.2.** Experience exchange programmes at the national and international level **1.1.3.** Promotion of industries / key specialisation	**1.2.** Construction of the intellectual potential of regional specialisation **Measures:** **1.2.1.** Creation of training programmes for regional specialisation **1.2.2.** Staff exchange programmes between science and business **1.2.3.** Vocational and technical education, tailored to the needs of companies **1.2.4.** Specialist advice and training	**1.3.** Improving communication in the area of regional specialisation **Measures:** **1.3.1.** Preparation of the offers for cooperation between science and business **1.3.2.** Supporting efforts of mutual communication within the specialisation **1.3.3.** Dedicated training and brokerage meetings within the specialisation	**1.4.** Support for cooperation projects within clusters and areas of specialisation **Measures:** **1.4.1.** Establishing clear rules for cooperation **1.4.2.** Realising research and development projects within the regional specialisation **1.4.3.** Support for the process of technology transfer from science to business **1.4.4.** Interregional and international cooperation	1.5. Providing a financing system of projects aimed at regional specialisation **Measures:** **1.5.1.** Financial support for projects within the regional specialisation

Operational objective 1.1. Building awareness of regional specialisation

Measure 1.1.1. Integration in the area of key industries

- **The justification and the objective of the measure**

To ensure the development of regional specialisation, information about the objectives and directions of innovation policy, which will be conducted in the region, must be distributed first. The aim is to build awareness among companies operating in key industries / specialisations of the region regarding the types of support, potential growth opportunities and the tools that will include these entities in the RIS LORIS 2030.

- **Description of the measure**

Within the measure, works are expected to be undertaken, enabling the identification and integration of businesses, R&D institutions, universities, technical and vocational schools, and other organisations active in the field of industries / specialisations key to the development of the lodzkie region, pointed out in the Development Strategy for the Lodzkie Region 2020, with particular focus on the areas identified in the framework of regional smart specialisation. This activity will be the starting point for the implementation of tasks designed to raise awareness of entities operating in the key specialisations of their role in the shaping of the innovation policy of the region, as well as identification of opportunities and benefits from the inclusion of these entities into the cooperation network. As part of measures performed in this scope, a key area should also be constituted by making available information about the possible forms of cooperation establishment, including the promotion of good practices, as well as elements of ethics in business.

- **Tasks to be implemented within the measure:**
  - Identification of the entities operating in areas identified as industries / specialisations key for the region;
  - Appointment of entities that are coordinators in a cooperation network in the areas of industries key to the development of the region;
  - Analysis of the needs of the entities and possible areas of cooperation, including an indication of the benefits of joint initiatives;
  - Definition of pilot projects that can be implemented in key areas of regional specialisation;
  - Providing training and meetings, promotional campaigns designed to identify opportunities for integration and implementation of joint projects to entities operating in areas of industries key to the development of the voivodeship.
- **Planned products and results**
  - Grouping of entities within the cooperation network;
  - Appointment of coordinators for the different key industries in the region;
  - Raising awareness of entities operating in the areas of industries crucial for the development of the region, of innovation policy pursued in the region;
  - Identification of possible areas of cooperation for the individual entities operating in key industries and preparation of guidelines for the implementation of joint projects, including pilot projects.

Measure 1.1.2. Experience exchange programmes at the national and international level

- **The justification and the objective of the measure**

A vital matter for the growth of innovation is to derive patterns from entities with more experience and „know-how" in selected areas that have been identified as key to the development of the region. Therefore, it is necessary to obtain the best and the most advanced knowledge of the solutions used in selected areas at the national and international level, in the framework of contacts with organisations specialised in selected areas. The aim is to enable the exchange of experience between the entities functioning in key industries / specialisations of the region, both with entities operating in parallel industries at the national level, as well as within the network and platforms for exchange of experience at the international level.

- **Description of the measure**

This measure is expected to implement the tasks that provide the opportunity to exchange experiences of entities operating in key industries / specialisations of the lodzkie region, both at the national level with the other entities, among others, clusters, networks, institutions and companies, as well as at the international level. The exchange programmes are expected to organise partner visits, meetings, presentations, according to needs, interests and skills of future participants. As part of the undertaken measures, the following ought to be ensured: possibility of making a comparison, by enterprises from the Lodzkie Region, of processes and practices used in other innovative enterprises stated to be the best, as well as adaptation of best practices to companies operating in the lodzkie region.

- **Tasks to be implemented within the measure:**
  - Identification of potential partners for cooperation in the area of key industries / specialisations at the national and international levels;

- Preparation of projects aiming to establish national and international contacts and exchange of experience (exchange of best practices, know-how, etc.);
- The creation of financial instruments allowing the implementation of joint projects regarding exchange of experiences at the level of inter-regional, national and international cooperation.

- **Planned products and results**

  - Creating a list of potential partners for cooperation at national and international levels;
  - Establishment of cooperation and exchange of experiences with partners at national and international levels;
  - Building of sustainable partnerships especially with entities from the list of identified partners.

Measure 1.1.3. Promotion of industries / key specialisations

- **The justification and the objective of the measure**

The lodzkie region does not have a clear and identifiable image as a modern region, capable of taking innovative action. It is necessary to provide tools for the activation of the internal and external promotion of the region. It is important to make use of the key industries in this attempt, which should be the showcase of the voivodeship and affect the improvement of the region's image. It will also provide a basis for conducting a policy of promotion by regional entities operating internationally.

- **Description of the measure**

This measure is expected to provide the tools that will ensure promotion of the region with the help of key industries. As part of this measure, it will be possible to take part in national and international trade fairs, promoting innovative companies. Trade fairs are the most effective place for promotion, exchanging offers and signing agreements for specific innovative technologies and equipment. They are also an opportunity and the right place to promote the economy. Their effect is the increase in the interest of potential foreign investors and showcasing the region's investment opportunities. This task should be closely correlated with the measure proposed regarding the integrated policy of investment in the region.

- **Tasks to be implemented within the measure:**

  - Identification of key trade fairs, in which the region should annually promote key industries and specialisations, and events that can be implemented in this area in the region;
  - Organisation of regular, international conferences, motivating to work, invest and do business in the lodzkie region, with a particular emphasis on promoting the specialisations of the region;
  - Participation in trade fairs and trade missions organised at national and international level, with a particular emphasis on promoting the key specialisations;
  - Developing a support system for the participation in trade fairs and trade missions of innovative companies - especially SMEs and research centres in the region.

- **Planned products and results**

  - Preparing lists of major trade fairs and missions, in which entities from the region should take part;
  - Promotion of key industries and the specialisations of the region within trade fairs and trade missions, organised at the national and international levels;

- Organising regular international conferences, promoting key industries and specialties of the region;
- Promotion of, and participation in, trade fairs, trade missions of innovative companies - especially SMEs and research centres from the region.

Operational objective 1.2. Construction of the intellectual potential of regional specialisation

Measure 1.2.1. Training programmes for regional specialisation

- **The justification and the objective of the measure**

To ensure the development of key industries / specialisations in the region, it is necessary to provide staff with the right skills in selected areas. Today, many graduates do not have the skills and qualifications sought and needed on the labour market. The aim is to prepare and tailor the qualifications of staff for the directions of development of the innovative regional economy, both at the level of tertiary, technical and vocational education.

- **Description of the measure**

The measure is expected to prepare training programmes that will provide the appropriate staff in the area of specialisations identified in the RIS LORIS 2030 for the Lodzkie Region. Educational institutions working closely with companies, NGOs, professional associations, chambers of commerce and industry, as well as individual entrepreneurs, play an important role in the formulation of training programmes, as only the joint efforts and knowledge of the current needs of the labour market allow to formulate educational programmes meeting the requirements of employers. The influence of employers on the education system ensures an increase of its efficiency, which in turn translates into the possibility of absorption of graduates into the business. Businesses need to develop the education system by commenting curricula, having active participation in the teaching process and acting as business leaders in the region. Public intervention should be focused on the reorganisation of the learning process, which will provide graduates with the skills essential for the creation of appropriate conditions for the development of enterprises, in particular small and medium-sized businesses in the key industries / specialisations.

- **Tasks to be implemented within the measure:**
  - Identification of the entities and educational institutions providing training in the areas of specialisation of the lodzkie region as well as their possibility and preparation within the scope of education to the benefit of regional specialisation;
  - Analysis of the actual entrepreneurial demand for vocational, technical school graduates, university graduates as well as the needs of businesses and possible areas of cooperation with educational institutions in the development of educational programmes conforming to the requirements of employers;
  - Defining the key projects to be implemented in the field of education for the purpose of key industries / regional specialisations;
  - Preparation of proposals for training programmes for key sectors / regional specialisations by educational institutions, commented by employers, NGOs, professional associations, chambers of commerce and industry;

- Implementation of training programmes in educational institutions for the purpose of key industries / regional specialisations;
- Systematic monitoring and evaluation of the effectiveness of the implemented training programmes and the needs of companies regarding the sought-after skills.

- **Planned products and results**

  - A list of entities and educational institutions providing training in the areas of key specialisations of the lodzkie region, as well as a diagnosis of the state of preparation of such entities to provide education to the benefit of the region's specialisation;
  - Diagnosis of the actual entrepreneurial demand for vocational and technical school graduates, as well as the possible areas of cooperation with educational institutions within the scope of creating education programmes which meet the requirements of employers;
  - Consulted proposals for programmes of training for the purpose of key sectors / regional specialisations, prepared by educational institutions on the basis of the needs reported by employers;
  - A list of key projects to be implemented in the area of education for the purpose of key industries / specialisations of the lodzkie region;
  - Implementation of training programmes in educational institutions for the purpose of key industries / regional specialisations;
  - Evaluation of the effectiveness of the implemented training programmes and their systematic adaptation to the needs of companies in the key industries / specialisations.

Measure 1.2.2. Staff exchange programmes between science and business

- **The justification and the objective of the measure**

To ensure the development of key industries / specialisations in the region, it is necessary to increase the flow of knowledge between science and business in these areas. At the moment, the needs of entrepreneurs are reflected at the level of research and development work in research institutions in the region in a very limited extent. Effective use of the knowledge, acquired during research work, is only possible while facing practice, therefore, it is necessary to closely link the area of science to the area of business through direct contacts of persons representing these environments. Most of the employees recruited, in the opinion of the majority of the companies, do not have sufficient practical preparations for the effective performance of tasks in the workplace. The purpose of the measure will be to establish exchange programmes between science and business in the areas of specialisations of the region.

- **Description of the measure**

Tasks performed under this measure are to give the opportunity to familiarise the employees of science with the needs of companies, with their level of development, and the problems that may be the subject of collaborative research. For entrepreneurs, it will create an opportunity to better clarify the issues that can be successfully tackled by researchers. It is necessary to establish contacts between representatives of the two communities to bring about a partnership between science and the economy of the region, in particular in the area of regional specialisations, and facilitate the implementation of joint research and development projects. Employees of the R&D sector should acquire knowledge of the need for implementation of the pro-innovation measures in enterprises and identify the mechanisms, tools, and

opportunities to support innovation activities in the education sector. Thus acquired expertise may also be used for the implementation of joint innovation projects. Also supported, as part of the measure, should be cooperation of enterprises with student organizations which organize workshops and engineer courses under foreign exchange. This will allow students from the lodzkie region to obtain new knowledge abroad, as well as help to bring new researchers from other countries to the region.

- **Tasks to be implemented within the measure:**
  - Analysis of the needs of entrepreneurs regarding the possibility of an exchange of personnel with scientific institutions in the areas of regional specialisation;
  - Indication of the bodies responsible for coordinating the exchange of personnel between science and business in the areas of specialisation;
  - Preparing the system for the exchange of offers of employees of research institutes and companies;
  - Development of programmes, and the scope of internships and work experience at various levels of merit;
  - Development of internship / work experience funding programmes (also in research entities and foreign companies);
  - Organization of internships / work experience in domestic and foreign entities within the areas of specialisation.
- **Planned products and results**
  - A list of the needs of entrepreneurs regarding the exchange of personnel with scientific entities;
  - The database of the offers of employees of research institutes and companies regarding the exchange of personnel in the areas of specialisation;
  - Transfer of knowledge between science and business, the acquisition of professional and business experience by researchers and increasing the awareness of the possibilities of using scientific knowledge in business by organising internship / work experience programmes and programmes funding the exchange of personnel between science and business.

Measure 1.2.3. Development of vocational and technical education to meet the needs the specialisations of the region

- **The justification and the objective of the measure**

One of the main problems identified in the area of education in the lodzkie region is the limited access of enterprises to professionally and technically educated staff. Employers in the region compete for workers with vocational and technical education, and the costs of their acquisition are increasing. The quality and availability of human resources is also crucial for potential investors operating on the basis of modern technologies, therefore, technical and vocational education should be included in the process of building a knowledge-based economy. Consequently, there is an urgent need to develop tools and support programmes that will enable the promotion and intensification of vocational and technical education, in collaboration of educational institutions with companies from the region. The aim is to increase the importance of vocational and technical education and training, as well as increase access to a staff educated to meet the needs of the region's specialisation.

- **Description of the measure**

As a part of this measure, it is important to implement initiatives aimed at changing stereotypes and promoting professional education and technical training at the lodzkie region level. There is also a need for greater involvement of entrepreneurs in the organisation of practical training, in the development of common curricula and determining the folder of necessary qualifications for the future graduate. Support under this measure should enable the establishment of direct cooperation between educational institutions and enterprises, and the implementation of projects and educational programmes prepared by them for regional specialisation, including assurance of modular education (education in a school along with workshops at a work facility). Such support will facilitate the acquisition and training of new employees in a manner compatible with the needs of businesses. With this type of action, companies will have properly prepared employees, and at the same time will build their image as entities responsible for the development of the region. Educational institutions will be able to use the equipment, technology and educational materials available for companies for educational purposes. Implementation of companies' projects in close collaboration with educational institutions, will allow adjustment, update and modification of existing curricula to the needs of their businesses for the purpose of regional specialisation.

- **Tasks to be implemented within the measure:**
  - Support of joint programmes and projects implemented by businesses and educational institutions in order to promote and support expansion of the facilities necessary to provide vocational and technical education for the purpose of regional specialisation;
  - Supporting programmes and projects, implemented by entrepreneurs and educational institutions, including the creation and implementation of joint programmes of vocational and technical education for the purpose of regional specialisation.
- **Planned products and results**
  - Increasing the relevance of technical and vocational education and training, as well as increasing access to a staff adequately educated for the purpose of regional specialisation through the implementation of programmes and projects in collaboration of entrepreneurs with educational institutions regarding the promotion of vocational and technical education, and the establishment and operation of joint educational programmes.

Measure 1.2.4. Support for the businesses' needs for training and advice for the purpose of regional specialisation

- **The justification and the objective of the measure**

One of the main factors, in addition to financial support, indicated by companies in the region as an incentive to implement innovation, was the access to advisory support. Advisory support currently available to entrepreneurs in the lodzkie region is very scattered and fragmented across multiple entities, and often does not meet the individual needs of selected groups of entrepreneurs. To enable the effective development of key specialisations of the region, there is a need to provide access to comprehensive training and consulting services for the capabilities of preparation and execution of innovative projects in selected areas of specialisation.

- **Description of the measure**

Effective use of the services provided by business environment institutions, regarding consulting and training, will meet its function when it is proposed to specifically provide dedicated support for certain groups and types of entities, in accordance with their individual needs. Therefore, the prepared projects and programmes to support the needs of training and consulting of the companies in key industries / specialisations should always be based on a thorough analysis of the needs of these companies. In addition, under the proposed tools, there should be provided a comprehensive, long-term aid to a company, from the moment the idea for an innovative project is developed, through the support of entities in the preparation of such a project, identification of possible sources of funding, up until the execution and settlement of such a venture. The project within the said scope should be possible to be implemented both by coordinators appointed for industries / key specialisations and external entities in selected areas in need of specialist support.

- **Tasks to be implemented within the measure:**
  - Identification of training and consulting needs of companies operating in the areas identified as key industries / specialisations of the region;
  - Definition of pilot training and consulting projects that can be implemented for selected groups of entities in key areas of regional specialisation;
  - Indication of the entities responsible for the preparation and coordination of training and consulting projects in selected areas of regional specialisation;
  - To provide comprehensive consulting and training services to companies operating in key areas for the development of industries in the region, including, among others: vouchers for advisory support, vouchers for training, technology audits for companies.
- **Planned products and results**
  - Appointment of coordinators responsible for the preparation and coordination of training and consulting projects in selected areas of regional specialisation;
  - Definition of pilot training and consulting projects;
  - Ensuring access to comprehensive consulting and training services for companies operating in the fields of industry / specialisation crucial for the development of the voivodeship, including vouchers for consulting, training, technology audits for companies.

Operational objective 1.3. Improving communication in the area of regional specialisation

Measure 1.3.1. Preparation of the offers for cooperation between science and business

- **The justification and the objective of the measure**

The analysis of the situation in the region shows that entrepreneurs have very limited knowledge of the capabilities of the region's entities in the realm of science to support their businesses in the field of research and development. Acquiring knowledge by the companies about the possibilities and the scope of cooperation on the university's part is very difficult due to the large dispersion of such information in the structures of these entities, in respect of areas of activity of individual organisational entities. Therefore, there is a need to develop cooperation offers of the science sector for business in the industries / specialisation crucial for the development of the voivodeship. The aim is to provide the entrepreneurs

with quick access to information about the offer of scientific entities, and point out potential areas in which it will be possible to cooperate in the field of research and development.

- **Description of the measure**

The priority issue within the measure will be to prepare a comprehensive project, including an indication of the offer of academic institutions for all industries / specialisations identified as crucial for the development of the region. At the same time, there is a need to involve representatives of companies from various industries in the consultation process regarding the preparation of tenders on behalf of the scientific institutions. This will ensure the development of materials in a clear and understandable manner, using a language understandable for the average entrepreneur. Equally important within the measure will be to provide a system of upgrades to the prepared offers in the long term and to adjust them for any changes made during the implementation of RIS LORIS 2030.

- **Tasks to be implemented within the measure:**
  - Identification of entities and institutions engaged in research and development in the areas of specialisation of the lodzkie region;
  - Designation of the entity responsible for the preparation of a complex project involving the preparation of the offer of scientific institutions for all industries / specialisations identified as crucial for the development of the region;
  - Development of the project, including preparation of the offer of scientific institutions for all industries / specialisations identified as crucial for the development of the region, and a system of updating and disseminating information about the prepared offer;
  - Publishing offers on the Lodz Knowledge Transfer Platform, and on the websites of the various scientific institutions;
  - Carrying out promotional activities in order to disseminate knowledge about the offer of research entities especially among those operating in key sectors / specialisations of the region.
- **Planned products and results**
  - A project that includes the preparation of the offer of scientific institutions for all industries / specialisations identified as crucial for the development of the region, and a system of updating and disseminating information about the prepared offer;
  - Dissemination of knowledge about the offer of research entities among those operating in key sectors / specialisations of the region.

Measure 1.3.2. Supporting efforts of mutual communication within the specialisation

- **The justification and the objective of the measure**

Lack of information and a limited level of mutual communication between the entities in the areas of innovation and technology transfer in the region have been indicated as one of the main barriers for the development of innovation in the region. Building specialisation in the region will not be possible without improving mutual communication and ensuring a constant flow of information among entities operating within the key industries / specialisations of the region. The main objective is to provide communication between entities within regional specialisation by providing the tools necessary to create an effective system of information flow.

- **Description of the measure**

As a part of this measure, tasks that allow the preparation of tools and the development of a system of information exchange and mutual communication will be carried out. An important feature of the system, from the point of view of the participants, is to build thematic-industrial subnets to obtain the link between the functional entities, associated with the defined problem areas. The communication system in the areas of expertise should be a part of the whole communication system within the Regional Innovation System. However, due to the importance of the key specialisations for the development of the lodzkie region, it should be treated as a priority and be prepared in the first instance on the basis of the appropriate tools intended for the implementation of the RIS LORIS 2030, that is the Lodz Knowledge Transfer Platform, the institutions designated as coordinators within the key specialisation, as well as Technology Transfer Centres, and other entities included in the system of implementation of the RIS LORIS 2030.

- **Tasks to be implemented within the measure:**
  - Preparation of a communication and information flow plan, pointing out who is responsible for communication in different institutions;
  - Using the Lodz Knowledge Transfer Platform as an interactive tool to support the flow of information and communication between the entities;
  - Organisation of cyclic thematic meetings in the areas of specialisation.
- **Planned products and results**
  - A communication and flow of information plan, pointing out who is responsible for communication in different institutions;
  - Interactive tools to support the flow of information and communication within the Lodz Knowledge Transfer Platform;
  - Cyclical, thematic meetings in the areas of specialisation.

Measure 1.3.3. Dedicated training and brokerage meetings within the specialisation

- **The justification and the objective of the measure**

Improving the process of communication, networking, and exchange of experience between the companies and other entities operating in the region, allow further establishment of cooperation and implementation of joint projects. The organisation of meetings for training and brokerage based on previously verified profiles between companies and entities interested in cooperation is the instrument to ensure the intensification of this phenomenon. The aim is to create a platform for communication between those entities offering and seeking technologies from key industries / specialisations and to facilitate the establishment of business contacts between companies and scientific research entities at regional, national and international level.

- **Description of the measure**

As a part of the measure, projects for the organisation of training and brokerage meetings aimed at promoting innovative technology services and products, the establishment of partnerships between providers of new technological solutions and companies interested in the implementation and strengthening of cooperation between entrepreneurs, R&D and tertiary education institutions, involved in research in

the key industries / specialisations of the region, as well as enabling operators to offer innovative solutions to expand into new markets, will be carried out. The key issue in this regard is to prepare projects to be precisely profiled to the needs of companies operating in the key industries / specialisations of the region. An important issue is the inclusion of large enterprises into these activities, reporting a need for new technologies and innovations that could be directed to SMEs. The integral component of support in this area should be legal counsel for the cooperation between the parties involved in the meeting with the use of the potential of the technological system brokers implemented as a part of the RIS LORIS 2030.

- **Tasks to be implemented within the measure:**
  - Analysis of the needs of companies operating in the key industries / specialisations of the region regarding the demand;
  - Preparation of projects involving the needs of entities for training and brokerage meetings;
  - Organisation of training and brokerage meetings within the thematic areas of specialisation;
  - Legal and advisory support for the entities involved in training and brokerage meetings, using the potential of the technological system brokers implemented as a part of the RIS.
- **Planned products and results**
  - Demand of entities operating in the key industries / specialisations of the region for training and brokerage meetings;
  - Facilitating the establishment of business contacts and cooperation between enterprises and research and consulting entities through the implementation of projects including training and brokerage meetings within the specialisation and consulting and legal support with the use of the potential of the technological system brokers implemented as a part of the RIS LORIS 2030.

Operational objective 1.4. Support for cooperation projects within clusters and areas of specialisation

Measure 1.4.1. Establishing clear rules for cooperation

- **The justification and the objective of the measure**

Building an effective system of technology transfer is not possible without the preparation of transparent rules for cooperation, which will be clear and understandable for all participants in this process. The aim is to improve the situation with regard to the preparation and use of scientific procedures for cooperation with enterprises through developing and implementing solutions that will facilitate and simplify the process of signing agreements between research entities and external entities within the implementation of joint research and development projects and technology transfer.

- **Description of the measure**

This measure is expected to provide for the appointment of a consortium / network of Technology Transfer Centres operating within the universities in the lodzkie region, which, in collaboration with entrepreneurs, will implement a comprehensive project for the preparation of transparent procedures for the model of cooperation between scientific entities and entrepreneurs. As a result, „standard" paths of cooperation

should be prepared, which will reduce administrative barriers on the part of scientific institutions, among others, including:

- Procedures and agreements relating to the provision of consulting and advisory services;
- Various forms of license agreements;
- Various forms of agreements for the provision of an unprotected project that is secret (know-how);
- Various forms of agreements for the transfer of rights (community of rights, tenancy);
- Solutions for the creation of spin-offs and in kind contribution;
- Organisational and legal solutions for the provision of research equipment to external entities;
- Procedures for the valuation of owned intellectual property.

The model structures, prepared as a part of the project, will be then implemented by scientific entities and made available for entrepreneurs interested in cooperation.

- **Tasks to be implemented within the measure:**
  - Appointment of a consortium / network of Technology Transfer Centres operating within the universities in the lodzkie region;
  - Preparation of a comprehensive project for the preparation of transparent procedures for the model of cooperation between scientific entities and entrepreneurs with entrepreneurs;
  - Implementation of the model procedures in scientific institutions and making them available to entrepreneurs interested in cooperation.
- **Planned products and results**
  - Appointing a consortium / network of Technology Transfer Centres operating within the universities in the lodzkie region;
  - Preparation and implementation of the model procedures for the cooperation between scientific institutions and entrepreneurs.

Measure 1.4.2. Realising research and development projects within the regional specialisation

- **The justification and the objective of the measure**

The previous low propensity for cooperation between enterprises and the science sector on the one hand, and too general results of research on the other, which are insufficient for direct implementation, are a significant barrier for the development and strengthening of innovative enterprises in the lodzkie region. A major barrier is the lack of adequate research infrastructure in enterprises, including research laboratories, which could prepare the results of research conducted by research institutions for practical applications. The aim is to build an efficient and effective process of commercialisation of research and the implementation of innovative projects. This requires the support of ventures involving the joint conduct of research and the implementation of their results by the research entities and enterprises, as well as business groups and clusters within the regional specialisation.

- **Description of the measure**

To strengthen the capacity of firms in the lodzkie region, it is extremely important to develop the R&D infrastructure and support the research and development activities carried out on the basis of this infrastructure. This activity is of great importance to the process of creating innovation. However, it is associated with a serious financial burden, especially for small and medium-sized enterprises, that predominate in the region. In addition to developing their potential, R&D should also use the feasibility of industrial research and development based on the infrastructure facilities of universities and other scientific institutions specialised in the provision of services in this area. This measure is expected to implement the tasks to encourage SMEs to initiate cooperation with scientific research institutions, as well as to stimulate SMEs to create research facilities within their own structures. However, given that the research entities are often equipped with scientific research facilities, the potential of which is not currently used within the measure, projects that take into account the use of the R&D infrastructure currently existing in the Lodzkie Region, and further projects, including the development of a component, or creating it from scratch, should be rewarded. The activities undertaken in this area should be initiated and supported by entities currently involved in the processes of development of cooperation between business and universities and R&D entities, including by: CTT, science and technology parks, the Lodz Special Economic Zone, scientific and technical associations, etc.

- **Tasks to be implemented within the measure:**
  - Preparation of joint research and development projects in the area of regional specialisation.
- **Planned products and results**
  - Commercialization of scientific research and the implementation of innovative projects through the implementation of joint research and development projects in the area of regional specialisation.

Measure 1.4.3. Support for the process of technology transfer from science to business

- **The justification and the objective of the measure**

The main weakness of the research entities of the region is the minimal activity in the area of the commercialisation of knowledge and new technologies. The research results, publications and patents of regional scientists rarely translate into market use in new products, technologies and services. Even though the universities of the region have patent applications and obtain patents, it does not translate into moving the results of research to a developed economy. Intensified cooperation between enterprises and scientific institutions in the field of technology transfer and dissemination of advanced forms of cooperation in this field should be the aim of the activities in this area.

- **Description of the measure**

To strengthen the technology transfer process, it is necessary to prepare new organisational models and instruments and specialised support institutions. The sector of the business environment institutions is an important partner, facilitating the implementation of various forms of technology transfer between science and industry, as well as between companies. In the lodzkie region it requires a strengthening in the field of the potential of knowledge and skills related to technology transfer, particularly in the field of regional specialisation. The activities undertaken in this area should be initiated and supported by entities currently involved in the processes of development of cooperation between business and universities and R&D entities, including by: CTT, science and technology parks, the Lodz Special Economic Zone, scientific and technical associations, etc.

- **Tasks to be implemented within the measure:**
  - Identification of business environment institutions and providers of specialised services in the field of technology transfer in the area of regional specialisation;
  - Analysis of the needs of entrepreneurs in the demand for services of institutions in the field of technology transfer in the area of regional specialisation;
  - Strengthening the capacity and competence of the business environment institutions in the activities in the area of technology transfer;
  - Construction of the offer of specialised services in the field of technology transfer for the functional areas and key industries / specialisations;
  - Preparation and implementation of projects aimed at improving the offer of specialised services in the field of technology transfer based on the identified needs of enterprises.
- **Planned products and results**
  - A list of suppliers of specialised services in the field of technology transfer in the area of regional specialisation;
  - Improvement of the offer of specialized services in the field of technology transfer through the implementation of projects based on the identified needs of enterprises.

Measure 1.4.4. Cooperation, including interregional and international cooperation

- **The justification and the objective of the measure**

Cooperation on a regional and interregional level is an important element of the policy of development of innovation, it provides a flow of experiences between entities from the environments of different regions and countries, so it produces the effect of strength, knowledge and potential synergy. It is also an opportunity to benefit from the rich knowledge of more experienced foreign partners. The aim is to provide support for the establishment of cooperative relations in the region, including the development of clusters and networks, as well as instruments allowing entities functioning in key industries / sectors the implementation of projects of interregional and international cooperation. Creating cooperation networks reaching outside the voivodeship allows local entities to experience the similarities and differences in the dimension of innovative business ventures. It also provides the opportunity to exchange, develop and deepen their knowledge, connects, forwards and opens new perspectives for the development of ideas and strategies.

- **Description of the measure**

Intraregional, interregional and international cooperation of entities from the voivodeship in the area of key specialisations should include, in particular, the creation and development of clusters and networks in selected areas of key industries, as well as participation in the projects being the continuation of *Measure 1.1.2. Experience exchange programmes at the national and international level*. Under this measure, the ideas for joint R&D projects and initiatives, generated within the exchange programmes, at the regional, as well as inter-regional and international levels, should be supported. Cooperation between entities from the lodzkie region and networks of other regions and countries should include the implementation of identified best practices, lead to the implementation of innovative solutions, promote regional entities, their products, services and technologies on international markets, and create jobs based on knowledge. Objectives of the jointly implemented projects within the clusters and cooperation

networks should contribute to improving the competitiveness, productivity and promotion of entities from the region. A prerequisite is to ensure constant participation in such initiatives of the entities from the corporate sector, research and business environment institutions.

- **Tasks to be implemented within the measure:**
  - Support for projects regarding the creation and development of clusters in the key industries / specialisations of the region and the emergence of clusters and cooperation networks in the lodzkie region, including the promotion of clusters;
  - Identification of projects to be implemented under the interregional and international cooperation of entities from the region in the area of key specialisations;
  - Preparation of projects regarding international and regional cooperation;
  - Implementation of interregional and international cooperation projects.
- **Planned products and results**
  - The creation and promotion of clusters operating in the areas of key industries / specialisations of the region and the implementation of projects aimed at the development of key clusters;
  - Implementation of innovative projects, the conducting research and development works within the projects regarding international and regional cooperation in the area of key specialisations.

Operational objective 1.5. Providing a financing system of projects aimed at regional specialisation

Measure 1.5.1. Financial support for projects within the regional specialisation

- **The justification and the objective of the measure**

To facilitate the implementation of the various measures and projects in the field of regional specialisation, it is necessary to ensure adequate financial support to the extent provided in the RIS LORIS 2030. The aim is to plan and prepare financial instruments as to fulfill specific tasks designated to be undertaken within the specific operational objectives within *Priority. 1 Regional specialisation.*

- **Description of the measure**

The activities to be implemented under *Priority 1. Regional specialisation* will, to a vast extent, be financed from EU funds, in particular within the framework of the Regional Operational Programme and other programs at national level.[56] Therefore, there is a need to adjust the objectives and priorities of the ROP of the Lodzkie Region for years 2014-2020 in order to be consistent with the measures set out in this field in the RIS LORIS 2030. The criteria for evaluating projects and designing assistance in such a way that it induces the entities to cooperate, without causing substitution of funds, which may be derived from their own sources in the case of enterprises, will be a key issue in building support instruments in the ROP of the Lodzkie Region. Within the regional specialisation, it is necessary to integrate the selected measures, as well as to identify key projects, that should be prepared in the first place. Entities receiving assistance under *Priority 1. Regional specialisation* should have access to financing innovative investment projects, both within the scope of supporting the production and service investments, including, among others, covering the expenditures for investments and the ones associated with the conduction of research and development works, purchasing and transferring technology, purchasing of services (including

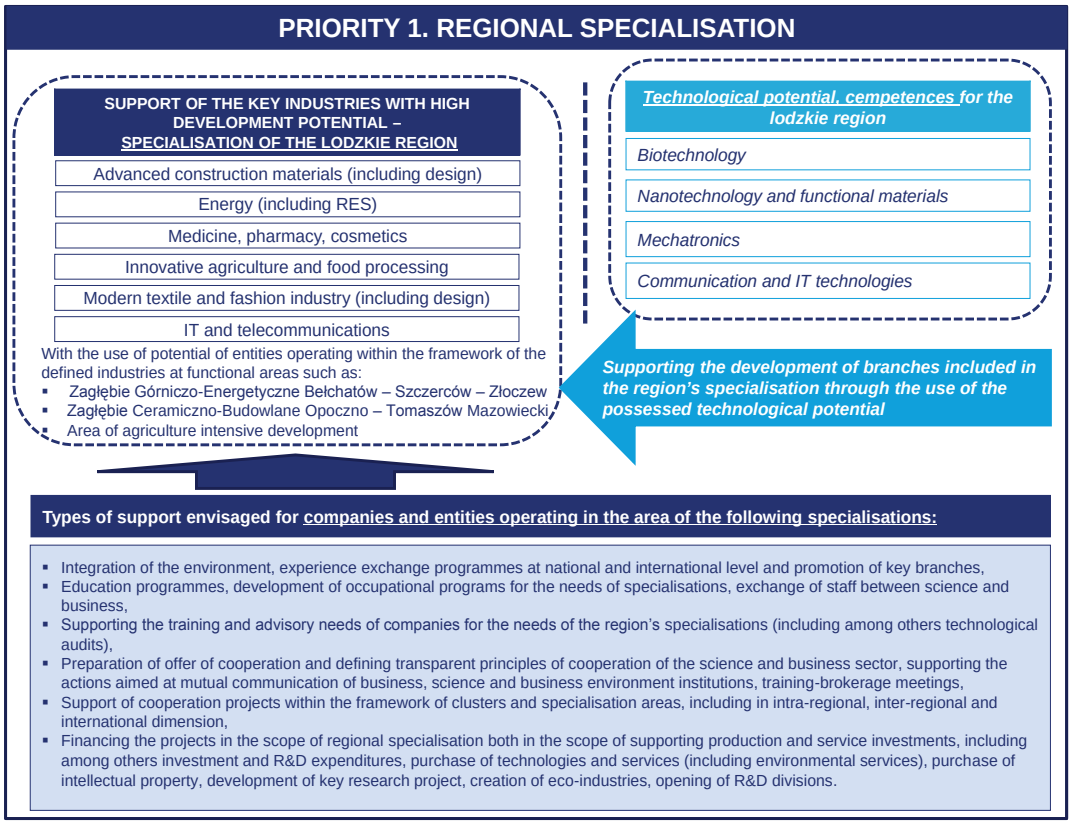
56 Taking into account the demarcation line between national and regional programs financed by the European Union.

environmental services) and intellectual property, development of the key research projects, or to creating eco-industries and opening R&D departments. However, close attention should be paid to the criteria for evaluation of projects to make sure that they have been prepared in such a way that guarantees the selection of the best projects in terms of regional specialisation, as well as projects enabling the stimulation of cooperation within networks in a way that allows the achievement of synergies.

- **Tasks to be implemented within the measure:**
  - Preparation of guidelines for instruments of support for measures to be implemented under *Priority 1. Regional specialisation*, and proposals for key criteria that should be taken into account at the design stage of the ROP of the Lodzkie Region for years 2014- 2020;
  - Consulting the prepared objectives and instruments of support with potential beneficiaries;
  - Adaptation of objectives and priorities of the ROP of the Lodzkie Region for years 2014- 2020 to the instruments of support for measures to be implemented under *Priority 1. Regional specialisation.*[57]
- **Planned products and results**
  - Ensuring effective sources of funding for the measures identified in the implementation of *Priority 1. Regional specialisation.*

The following pages present the summary of the measures as well as the schedule of their implementation within the framework of *Priority 1. Regional specialisation.*

Figure 30. Summary of measures indicated for implementation within the framework of *Priority 1. Regional specialisation*



Source: Own study.

57 Taking into account the demarcation line between national and regional programs financed by the European Union.

Table 28. Schedule of implementation of tasks within the framework of *Priority 1. Regional specialisation*

	Operating objectives and measures	Year / Quarter	2013 I II III IV	2014 I II III IV	2015 I II III IV	2016 I II III IV	2017 I II III IV	2018 I II III IV	2019 I II III IV	2020 I II III IV	2021 I II III IV	2022 I II III IV	2023 I II III IV	2024 I II III IV	2025 I II III IV	2026 I II III IV	2027 I II III IV	2028 I II III IV	2029 I II III IV	2030 I II III IV
Priority I. Regional specialization	**1.1 Creating the awareness in the scope of regional specialization**																			
	1.1.1 Integration of the environment in the area of key branches		■	■	■															
	1.1.2 Experience exchange programmes at national and international levels			■	■	■	■	■	■	■	■									
	1.1.3 Promotion of key branches			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.2 Creation of intellectual potential in the scope of regional specialization																			
	1.2.1 Educational programmes for the needs of specializations				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.2.2 Staff exchange programmes between science and business in the area of the specialization			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.2.3 Development of occupational and technological education for the needs of the region's specialization			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.2.4 Supporting the educational and advisory needs of companies for the needs of the region's specialization			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.3 Improvement of communication in the area of regional specialization																			
	1.3.1 Preparation of offer of cooperation of the science sector for business			■	■				■			■			■			■		
	1.3.2 Supporting the measures aimed at mutual communication within the framework of the specialization			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.3.3 Dedicated training-brokerage meetings within the framework of the specialization					■		■	■	■	■	■	■	■	■	■	■	■	■	■
	1.4 Supporting the cooperation projects within clusters and specialization areas																			
	1.4.1 Defining transparent cooperation principles			■	■			■			■			■			■			■
	1.4.2 Implementation of research and development projects in the scope of regional specialization				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.4.3 Supporting the process of technology transfer from science to business				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.4.4 Cooperation, including inter-regional and international one				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.5 Financing the projects aimed at the region's specialization																			
	1.5.1 Financial backup for the projects in the scope of regional specialization				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Source: Own study.

6.1.2. Priority 2. Development of innovative potential

Within *Priority 2. Development of innovative potential*, 5 operational objectives, and 12 measures within those objectives, have been selected for implementation.

Table 29. The list of operational objectives and activities within *Priority 2. Development of the innovative potential*

AREA	AWARENESS	KNOWLEDGE	COMMUNICATION	COOPERATION	FUNDING
Priorytet 2. Development of the innovative potential **The main beneficairies: students, businesses, SMEs, universities and schools at all levels of education**	**2.1.** Raising awareness of the benefits of innovation **Measures:** **2.1.1.** Shaping the attitudes of pro-innovative entrepreneurs, especially in the SME sector **2.2.2.** Promotion of regional innovation	**2.2.** Promotion of knowledge about innovation and entrepreneurship **Measures:** **2.2.1.** Curricula that promote innovation and entrepreneurship at all levels of education **2.2.2.** Promotion of eco- innovation **2.2.3.** Consulting and training activities to promote innovation **2.2.4.** Staff exchange programmes between universities and business to promote innovation	**2.3.** Platforms for the exchange of experiences and communication **Measures:** **2.3.1.** Supporting mechanisms of exchange of information and communication **2.3.2.** Dedicated brokerage training meetings for the development of innovation potential **2.3.3.** Activation of entrepreneurship in academia	**2.4.** Promotion of collaboration and cooperation of economic entities **Measures:** **2.4.1.** Supporting the establishment of cooperation and cooperation networking **2.4.2.** Supporting research and development projects carried out in cooperation between the academic and business sectors	**2.5**. Providing a financing system of the development of regional innovation potential **Measures:** **2.5.1.** Financial support for the development of projects regarding the innovative potential of the region

Operational objective 2.1. Raising awareness of the benefits of innovation

Measure 2.1.1. Shaping the attitudes of pro-innovative entrepreneurs, especially in the SME sector

- **The justification and the objective of the measure**

One of the major barriers for undertaking innovative projects in the lodzkie region is the problem of defining the concept of „innovation", noticeable among small businesses, and the lack of awareness about the benefits of the implementation of innovative projects. There is also a noticeably low level of social trust and a lack of real partnership in mutual business relations. This creates serious barriers for cooperation and joint ventures, also in the sphere of science-economy. The aim is, therefore, to create pro-innovative attitudes among entrepreneurs, including, in particular, the representatives of micro, small and medium-sized companies, as well as building awareness and knowledge of the role, as well as the benefits, of innovation and building an economy based on knowledge and collaboration.

- **Description of the measure**

As a part of this measure, initiatives will be undertaken, which will be aimed at encouraging, especially micro, small and medium-sized enterprises, to take an interest in innovation. It is necessary to shape awareness of the value and meaning of the term „innovation" in the lodzkie region, as well to point out the benefits of innovation for their businesses. The creation of pro-innovation attitudes of managers and

employees of businesses, and identifying best practices and good role models, which could be directly transferred to daily practice, arising from the experience of other companies in the country and abroad, is of particular importance. Showing examples of achieving success should encourage a willingness to take up the attitude of taking „reasonable risk" in business. Equally important is the increasing interest of entrepreneurs in cooperation with the science sector, and pointing out practical examples of such cooperation and its benefits. Activities in this area should also be accompanied by increased media interest in the topics of innovation, the themes addressed to SMEs. The implemented initiatives should be based on the results of an analysis of needs and targeted to specific groups of entities.

- **Tasks to be implemented within the measure:**
  - Conducting informational and promotional measures including: TV, Internet and press campaigns, aimed at selected target groups of enterprises, carried out in conjunction with specific RIS LORIS 2030 measures aimed at providing counselling and training support, in particular for SMEs;
  - Preparation and implementation of projects aimed at shaping the attitudes of pro-innovative enterprises, especially SMEs, including study visits, carried out at the level of the region and country, briefings on the activities carried out or planned in the RIS LORIS 2030, directed to selected groups of subjects, presentation of best practices and models relating to the implementation of joint projects - business and scientific institutions, as well as innovative projects which are examples of practical measures for specific groups of entrepreneurs in selected thematic areas;
  - Preparation and implementation of projects related to the construction of a pro-innovation culture of SMEs, including strategic management and planning of development based on innovation, and encouraging companies to use modern ICT tools.
- **Planned products and results**
  - Building pro-innovation attitudes, especially among SMEs, by conducting informational and promotional measures in conjunction with concrete RSI LORIS 2030 measures aimed at providing counselling and training support, in particular for SMEs under the RIS LORIS 2030, and projects targeted to specific groups of entities, based on an analysis of needs.

Measure 2.1.2. Promotion of regional innovation

- **The justification and the objective of the measure**

One of the most important factors of development based on innovation is the high quality of human capital and the awareness of the benefits of innovation. Therefore, it is essential that RIS LORIS 2030 helps shape the pro-innovation and pro-entrepreneurial attitudes of society, as well as the dissemination of information about the activities of pro-innovation in the region. This also applies to initiatives taken by companies, business environment institutions, scientific institutions and the administration. The aim is to promote innovation of the lodzkie region to create a friendly climate for understanding and shaping the culture of innovation.

- **Description of the measure**

As a part of this measure, tasks to raise awareness of the pro-innovation initiatives undertaken within the whole region should be carried out. This includes: the organisation of competitions for innovative

companies, visits to innovative organisations for children and young people (at each stage of education), contacts and lectures organised with the participation of innovators, organising competitions for young people, including cyclical business plan competitions in the area of innovation, also for students and doctoral students, as well as various competitions for innovative projects in the region for financial awards for projects presented in the competitions. Fairs and events organised in various industries in the region could also be used more to promote the innovation of the region, which could be combined with offers of innovative ideas and solutions, emerging in the lodzkie region. Regular annual innovation fairs could be used in order to better promote the idea of innovation within the region, to which representatives from all walks of life, related to the theme of innovation, would be invited (science, business, business environment institutions, government), and they would have the opportunity to present the best practices in the implementation of innovative ideas. The key issue in the field of the provided support is to coordinate activities in this area, so that the individual instruments applied do not interfere with each other and not generate unjustified expenditure.

- **Tasks to be implemented within the measure:**
  - Identification of key events in the region, which could be supplemented by elements of the promotion of innovation in the region;
  - Preparation of assumptions and identification of the main competitions, which should be organised and coordinated at the regional level;
  - Preparation of the key projects and identification of the entities responsible for the implementation of selected events;
  - Implementation of projects aimed at promoting the innovation of the region.
- **Planned products and results**
  - Promotion of the innovation of the region and creating a friendly climate for understanding and shaping the innovation culture through the implementation of key and individual projects.

Operational objective 2.2. Promotion of knowledge about innovation and entrepreneurship

Measure 2.2.1. Curricula that promote innovation and entrepreneurship at all levels of education

- **The justification and the objective of the measure**

One of the most important factors of development based on innovation is the high quality of human capital. Shaping attitudes that promote innovation and entrepreneurship, and building awareness of the benefits of innovation, should start from an early age and continue at various stages of education. The aim is to prepare and adjust the curriculum to promote innovation and entrepreneurship at all levels of education, especially with regard to the needs of SMEs in the region.

- **Description of the measure**

A very important element is the realisation of educational activities, especially among young people at all levels of education. An important role in promoting innovation will be played by educational programmes, addressed to students and graduates, focused on the development of entrepreneurship and innovation. Changes in the educational system to enhance innovation issues are essential and should include:

- Taking into account a wide range of business issues and aspects related thereto during the creation of curricula;
- Introduction of subjects directing thinking to the broadly defined „culture of innovation" to the curricula, and providing basic knowledge about it;
- Strengthening the role of practical activities and identifying opportunities to translate theoretical knowledge to everyday functioning;
- Demonstrating the capacity to implement innovations in the subjects taught, including study visits to companies;
- Skills to move around on the labour market and to actively seek opportunities to implement innovative projects;
- Activities that promote innovation and entrepreneurship in different terms.

- **Tasks to be implemented within the measure:**

  - Supporting programmes and projects stimulating the creativity and entrepreneurship of children and young people;
  - Supporting programmes and projects promoting entrepreneurship and innovation at universities;
  - Supporting programmes and projects regarding the inclusion of issues of innovation and entrepreneurship, with particular focus on the fields of study in the areas having the potential for the development of the lodzkie region.

- **Planned products and results**

  - Promotion of innovation and entrepreneurship at all education levels through the implementation of projects related to preparation and implementation of new curricula.

Measure 2.2.2. Promotion of eco-innovation

- **The justification and the objective of the measure**

Enterprises, especially SMEs, even though they understand the potential benefits of environmentally friendly innovations, they are often unaware of the need to implement them, and do not see them as opportunities to gain competitive advantage resulting from ecological innovation. Eco-innovation is one of the key policies of the European Union in relation to environmental challenges, such as pollution, inadequate natural resources and decreasing biodiversity.

Eco-innovation is any innovation (new technology, product, process or service) that can contribute to environmental protection and efficient use of resources).[58]

The aim is to raise the awareness of SMEs on eco-innovation and the bio-economy, as well as to promote investments that contribute to the reduction of material and energy consuming products and services, the rational use of water, the growth of exports of environmental goods and services.

- **Description of the measure**

Tasks aimed at disseminating information on best practices and good models for initiatives in the field of eco-innovation will be carried out within this measure. The tasks carried out in this area will include

58 http://ec.europa.eu/environment/pubs/pdf/factsheets/eco_innovation/pl.pdf

initiatives for promotion, training and consulting in the preparation and implementation of technological and non-technological innovation (process, product, organisational and marketing) to reduce material consumption and energy intensity of production and services, make rational use of water, increasing the exports of goods and environmental services, including environmental technologies, ICT, environmental management systems, eco-labelling and responsible marketing. Dissemination of the subject of eco-innovation can also be accomplished by organising competitions for innovative eco-projects in the region for financial rewards for the selected demonstrative projects. Support provided under this measure also requires taking into account the possibility of carrying out environmental audits of SMEs and vouchers for consulting.

- **Tasks to be implemented within the measure:**
  - Support programmes and projects regarding the dissemination of knowledge on eco-innovation and the bio-economy;
  - The organisation of competitions for innovative eco-projects;
  - Support programmes and projects for promotion, training and consulting in the area, including environmental auditing of SMEs and vouchers for consulting.
- **Planned products and results**
  - Dissemination of knowledge on eco-innovation and the bio-economy through the implementation of projects of programmes and projects for promotion, training and counselling, and the organisation of competitions.

Measure 2.2.3. Consulting and training activities to promote innovation

- **The justification and the objective of the measure**

Access to counselling support in the lodzkie region is very limited due to the high dispersion and fragmentation of the business environment institutions. To enable efficient support for entrepreneurs in the SME sector in the process of implementing innovation into their business practices, it is necessary to provide them with access to high-quality and comprehensive training and consulting services regarding the direct opportunities for their companies.

- **Description of the measure**

Support under this measure will be strictly dedicated to specific groups and types of entities, appropriate to their individual needs. Therefore, the prepared projects and programmes in support of training and consultancy needs of SMEs in their possible development and the quest for knowledge in the field of innovation in the area of their operation, should always be based on a detailed analysis of the needs of these companies and be done with regard to the subregional specialisations of the lodzkie region – in the functional areas. Initiatives should include complex instruments, including audits of innovation, identifying the opportunities for development and the needs of entrepreneurs in the area of product, process, marketing and organisational innovation, and then - consulting in the implementation of innovation, in which the economic operator will be able to obtain comprehensive advice, designed to lead to implementation of innovative solutions in response to the needs identified during the audit. In addition, under the proposed tools, a comprehensive, long-term aid for companies should be provided, from

the moment the idea for an innovative project is born, through the support of entities in the preparation of such a project, identification of possible sources of funding, to the execution and settlement of such an undertaking.

- **Tasks to be implemented within the measure:**
  - Supporting programmes and projects for the complex service of SMEs regarding training and consulting, and ensuring funding for the implementation of innovations, including conducting audits of innovation and vouchers for consulting;
  - Support programmes and projects for specialised consulting and training services resulting from the analysis of the needs of micro, small and medium-sized enterprises.
- **Planned products and results**
  - Implementation of programmes and projects including comprehensive consulting and training services, including vouchers for consulting, training, auditing innovation in enterprises and professional services;
  - Ensuring the access to comprehensive consulting and training services for SMEs operating in selected functional areas of the voivodeship.

Measure 2.2.4. Staff exchange programmes between universities and businesses to promote innovation

- **The justification and the objective of the measure**

The restricted flow of knowledge between science and business is now one of the main barriers for the development of innovation in the region. Thanks to cooperation between science and business, entrepreneurs can benefit from the latest achievements in science, technology and product solutions. The researchers directly involved in business activities gain experience and practical knowledge about the functioning of the economy. The aim of the measure is to strengthen cooperation with R&D and use of intellectual potential to enhance innovation and competitiveness of micro, small and medium-sized companies.

- **Description of the measure**

As a part of this measure, initiatives regarding internships, work experience and other forms of exchange of personnel will be supported, aiming at the improvement of the flow of experiences between representatives of the R&D sector and business. The key issue is to use existing scientific potential, the use of which in the companies' activities will contribute to the implementation of innovative ideas and strengthen their position in the market. Thanks to the measures taken in this area, it will be possible to commercialise knowledge and implement innovative solutions in businesses from the region.

- **Tasks to be implemented within the measure:**
  - Supporting programmes and projects relating to the organisation of internships at different levels of merit;

- Supporting programmes and projects for the organisation of practice at different levels of merit;
- Supporting programmes and projects relating to other forms of exchange of personnel between science and business to strengthen the competence of enterprises in the field of knowledge in the area of R&D and research procedures.

- **Planned products and results**

  - Transfer of knowledge between science and business, the acquisition of professional and business experience by scientific workers and an increased awareness of the possibilities of using scientific knowledge by employees of companies through the implementation of projects and programmes regarding the organisation of internships / practices and other forms of exchange of personnel between science and business.

Operational objective 2.3. Platforms for the exchange of experiences and communication

Measure 2.3.1. Supporting mechanisms of exchange of information and communication

- **The justification and the objective of the measure**

Lack of information flow and a limited level of mutual communication between entities operating in the region is one of the main barriers for the development of innovation. There are no region-friendly and comprehensive sources of information about the development of selected industries of the region, types of financial support available to SMEs, companies providing advisory, training and consulting services, R&D entities ready to cooperate, and examples of „best practices" relating to processes of innovation and cooperative networking between companies. Similar information and communication barriers also apply to other institutions involved in innovation activities in the region (R&D entities, supporting institutions, financial institutions, government offices, local authorities). The main aim is to create an effective system of information flow and mutual communication, which will support the integration of the entities within the functional areas identified in the lodzkie region.

- **Description of the measure**

As a part of this measure, tasks to prepare interpersonal specialised platforms will be supported, designed to handle innovation and transfer of knowledge and technology in the functional areas and sub-regional growth centres of the lodzkie region (excluding the areas covered by support in the framework of Priority 1), as a place for meetings and contacts, exchange, consultation for any businesses interested in innovation, their associations and research, educational and government institutions, and innovative business environment, that is:

- Platform for the Lodz Metropolitan Area (central sub-region);
- Platform for Tourism Areas of the River Valleys of Pilica, Warta and Bzura;
- Platform for the functional area „Bipolar system of Lodz and Warsaw".

Apart from the platforms covering the functional areas, also appointed should be platforms for sub-regions, which would cover the entities acting on all the other branch areas, as a place for meetings

and contacts, exchange of knowledge, consultations for all the businesses interested in innovation, their associations and research, educational and self-government institutions, as well as innovative environment of business of the selected sub-region, including:

- Platform for the Eastern sub-region;
- Platform for the Western sub-region;
- Platform for the Northern sub-region.

As a part of the platform it is necessary to prepare the tools and principles of information exchange and mutual communication. The system of specialised communication platforms in the functional areas and in sub-regional growth centres within the sub-regions of the lodzkie region, should be a part of the communication system within the Regional Innovation System, also based on the Lodz Knowledge Transfer Platform. It should be based on the already functioning entities / positions, e.g. leaders of particular sub-regions and directly related to the system of business support institutions, established under *Measure 3.3.1. Building a support system of communication and counselling.*

- **Tasks to be implemented within the measure:**
  - Preparation of guidelines for the construction of specialised platforms and plans for their communication and information flow, in conjunction with the Regional Innovation System, along with giving the responsibility for communication to different institutions of the system;
  - Use of the Lodz Knowledge Transfer Platform, as an interactive tool to support the flow of information and communication between entities in the functional areas and sub-regional growth centres of the lodzkie region;
  - Preparation of projects to support the operation of specialised platforms, including the organisation of regular, thematic meetings, and exchange of experiences based on the constructed system of business environment institutions.
- **Planned products and results**
  - Enabling the flow of information and improving communication through the creation of specialised platforms, and preparation of plans for their communication and information flow, in conjunction with the Regional Innovation System, along with giving the responsibility for communication to different institutions of the system;
  - Interactive tools for information sharing and communication within the platforms for the functional areas and sub-regional growth centres of the lodzkie region, with the use of the Lodz Knowledge Transfer Platform;
  - The operation of specialised platforms, including the organisation of regular, thematic meetings and exchange of experience on the basis of the running system of business environment institutions.

Measure 2.3.2. Dedicated brokerage training meetings for the development of innovation potential

- **The justification and the objective of the measure**

The bad financial condition and low innovative awareness of the SME sector cause that most entrepreneurs not currently able to formulate their technology needs and proposals for innovative solutions and then get them to R&D and implement them. Improving the process of communication, networking, and exchange of experience between the companies and entities of the R&D sector and business environment institutions operating in the region, are aimed at further establishing cooperation and implementation of joint projects. The instrument to ensure the intensification of this phenomenon is the organisation of training and brokerage meetings based on the pre-verified needs between companies and stakeholders interested in cooperation. The aim of this measure is the organisation of meetings dedicated to training and enabling brokers to establish cooperation with the entities offering and seeking technology, innovative solutions and facilitation of the establishment of business contacts between companies and scientific research entities in selected sectors / industries adapted to the profiles of companies operating in the functional areas and sub-regional growth centres in the sub-regions of the lodzkie region.

- **Description of the measure**

Within this measure, projects including the organisation of meetings dedicated to broker training for SMEs will be carried out in order to:

- Promote technologically innovative services and products;
- Establish partnerships between providers of new technological solutions and companies interested in their implementation;
- Identify possible areas of cooperation between SMEs, R&D and tertiary education institutions involved in the research;
- Get to know the need for new technologies and innovations of large firms, which could be implemented by SMEs;
- Enable providers of innovative solutions to expand onto new markets.

The key issue in this area is the preparation of dedicated projects, which will be precisely profiled to the needs of entities operating in the functional areas and sub-regional growth centres of the lodzkie region. Assistance in the sphere of legal advice in the scope of the cooperation between the parties involved in the meeting, using the brokers' technology system implemented in the RIS LORIS 2030, should be an integral component of support in this area.

- **Tasks to be implemented within the measure:**

- Preparation of projects involving meeting the demand of entities for training and brokerage meetings in selected sectors / industries, tailored to the profiles of companies operating in the functional areas and sub-regional growth centres in particular sub-regions of the lodzkie region;
- Organisation of training and brokerage meetings within the functional areas and sub-regional growth centres in particular sub-regions of the lodzkie region;
- Legal and advisory support for the entities involved in training and brokerage meetings, using the potential of the brokers' technology system, implemented in the RIS LORIS 2030.

- **Planned products and results**

  - The demand of entities in each subregion of the voivodeship for training and brokerage meetings, tailored to the needs within the functional areas;
  - Implementation of projects including for training and brokerage meetings for entities operating within the functional areas and sub-regional growth centres in particular sub-regions of the lodzkie region, as well as legal and advisory support, using the brokers' technology system, implemented in the RIS LORIS 2030.

Measure 2.3.3. Activation of entrepreneurship in academia and among young people

- **The justification and the objective of the measure**

One of the barriers identified in the area of the development of innovation in the lodzkie region is the limited tendency of students, graduates and postgraduates of universities to start their own business. Therefore, there is a need to stimulate entrepreneurship in the academic community and in the community of young people graduating from vocational and secondary schools, as well as to initiate measures to promote the creation of ideas for commercial activity and newly emerging innovative companies. The main objective of the project is to spread the idea of the development of entrepreneurship in the academic environment and among young people, as well as to stimulate and support the development of academic entrepreneurship and the students of secondary and vocational schools.

- **Description of the measure**

Various initiatives to promote and develop academic entrepreneurship should be taken as a part of this measure. This includes the creation of systems for the identification and evaluation of innovative ideas, promoting their development and supporting their creators through consulting and training. It is also important to provide opportunities to raise funds for research, design and preparation of concepts and financial models for the planned activities, including business plans, as well as support the development of new enterprises in the early stages of their operations. Newly created entities should be able to obtain comprehensive support, including the access to specialised training and consulting in the field of business and the aspects related to it, career counselling etc. In addition to incentive schemes for students, the preparation of appropriate business development programmes for the scientific staff should also be provided.

- **Tasks to be implemented within the measure:**

  - Supporting programmes and projects relating to the construction of systems of identification and evaluation of interesting projects in the academia;
  - Supporting programmes and projects for comprehensive support of innovative ideas, from the inception of an idea to its implementation, together with the necessary counselling and training at various stages of the process, including legal and advisory support to the academic enterprise;
  - Supporting programmes and projects for the creation of grant systems for the most interesting research, designed to launch businesses.

- **Planned products and results**

  - To encourage academic entrepreneurship through the implementation of programmes and projects designed to promote and identify innovative ideas, as well as business development support.

Operational objective 2.4. Promotion of collaboration and cooperation of economic entities

Measure 2.4.1. Supporting the establishment of cooperation and cooperation networking

- **The justification and the objective of the measure**

To effectively use the region's innovative potential, the idea of cooperation in line with the model of open innovation should be promoted. Lack of partnership and openness to collaboration makes it difficult to build network relationships and human capital. Low awareness of SMEs of the benefits flowing from cooperation with other entities, as well as reduced levels of trust significantly limit the creation of cooperative relations that go beyond traditional business relationships. It is important, therefore, to animate the cooperation between entities in order to create solid cooperation networks and clusters. The aim is to promote and support the creation of cooperative relations in the region, and create clusters and cooperation networks.

- **Description of the measure**

Networking and clustering is a means of transferring best practices, dissemination of innovation and development of strategy based on the experiences of others. Networking builds relationships between people, businesses and projects, and allows for synergies in the framework of joint activities. Establishing and strengthening the relationship between the groups of entities in line with business profiles can stimulate joint projects. The measure is expected to support projects aimed at informing about the benefits of the creation of clusters and enterprise networks, tools to support handling emerging network, the initial financing of co-operation and assistance in creating a business plan, as well as advice on the possibility of the development of this type of network.

- **Tasks to be implemented within the measure:**

  - Supporting programmes and projects to support the animation of cooperation, promotion of the concept of clusters and cooperation networks;
  - Supporting projects advising on strategy development, business plans, opportunities for expansion and financing of such networks;
  - Supporting projects regarding the formation of clusters and the creation of cooperation networks in the region, such as networks of clusters, science and technology parks, and laboratories providing services to entrepreneurs.

- **Planned products and results**

  - Promoting clusters and cooperation networks through the implementation of programmes and projects and supporting and animation of collaboration of businesses in the region;
  - Development of clusters and networks as a result of projects regarding the consulting and support of their creation.

Measure 2.4.3. Supporting research and development projects carried out in cooperation between the academic and business sectors.

- **The justification and the objective of the measure**

SMEs are a key element of the system of technology transfer in the lodzkie region. However, as indicated by the analysis of the regional situation, the demand for new technologies, generated by the business community of the region, has to be assessed as very low. It is one of the factors which results in a low innovative potential, also in comparison with other regions of Poland. The attitudes of businesses are affected by a variety of barriers that limit their participation in the uptake of new technologies related to the need to engage significant financial resources and difficulty in finding partners, and lack of information on available technologies and markets. At the same time, the SMEs' demand for technology solutions is not covered by the offer of research entities in the region. It is, therefore, necessary to create conditions conducive for establishing cooperation in the framework of R&D projects that will be tailored to the needs of SMEs.

- **Description of the measure**

Under this measure, support will be given to initiatives aiming to implement research and development projects in co-operation between the science and business sphere, groups of companies, and entities within the network, including technical, technological or organisational (industrial research and development) projects. To strengthen the innovation capacity of SMEs in the lodzkie region, it is also very important to develop a R&D infrastructure and support the research and development activities carried out on the basis of this infrastructure. Enterprises should primarily use the ability of conducting industrial research and development works on the basis of the existing infrastructure facilities of universities and other scientific institutions specialised in the provision of services in this area.

- **Tasks to be implemented within the measure:**
  - Supporting research and development projects in co-operation between the spheres of science and business.
- **Planned products and results**
  - Creating the conditions encouraging the establishment of cooperation within the framework of implementation of R&D projects tailored to the needs of MSP;
  - Commercialization of scientific research and implementation of innovative projects through the implementation of research and development projects in co-operation between the spheres of science and business.

Operational objective 2.5. Providing a financing system of the development of regional innovation potential

Measure 2.5.1. Financial support for the development of projects regarding the innovative potential of the region

- **The justification and the objective of the measure**

In order to facilitate the implementation of the various activities and projects in the field of regional specialisation, it is necessary to provide adequate financial support to the extent provided for in the RIS LORIS 2030. The aim is to plan and prepare financial instruments as to fulfill specific tasks, designated to be undertaken within the specific operational objectives under *Priority 2. Development of the region's innovative potential.*

- **Description of the measure**

Measures planned to realise *Priority 2. Development of the region's innovative potential* will mainly be financed from EU funds, in particular within the framework of the Regional Operational Programme of the Lodzkie Region for the years 2014-2020 and other programs at national level.[59] Therefore, there is a need to adjust the objectives and priorities of the ROP of the Lodzkie Region for the years 2014-2020 in order to be consistent with the measures set out in this field in the RIS LORIS 2030. The criteria for evaluating projects and designing assistance in such a way that it induces the entities to cooperate, without causing substitution of funds, which may be derived from their own sources in the case of enterprises, will be a key issue in building support instruments in the ROP of the Lodzkie Region for the years 2014-2020. As part of the development of the *Priority 2. Development of the region's innovative potential*, it is necessary to ensure access to financing, especially for micro, small and medium-sized enterprises, and to develop the skills of obtaining external funds for innovative ventures. Entities receiving assistance under *Priority 2. Development of the region's innovative potential* should have access to financing of innovative investment projects, regarding the product, process, organisational and marketing scope, both at the local, regional, and national and international level. Within this area, financing environmental investments, as well as the broader development of academic entrepreneurship and innovation, including: start-up, spin-off, etc., and promotion of the use of ICT tools, should also be rewarded. Support tools developed in the framework of *Priority 2. Development of the region's innovative potential* should stimulate the businesses' innovation-oriented attitude.

- **Tasks to be implemented within the measure:**
  - Preparation of guidelines for tools supporting the measures to be implemented under *Priority 2. Development of the region's innovative potential*, and of key criteria that should be taken into account at the design stage of the ROP of the Lodzkie Region for the years 2014-2020;
  - Consulting the prepared objectives and instruments of support with potential beneficiaries;
  - Adaptation of objectives and priorities of the ROP of the Lodzkie Region for the years 2014-2020 to the instruments of support for measures to be implemented under the RIS LORIS 2030 *Priority 2. Development of the region's innovative potential.*[60]

59 Taking into account the demarcation line between national and regional programs financed by the European Union.

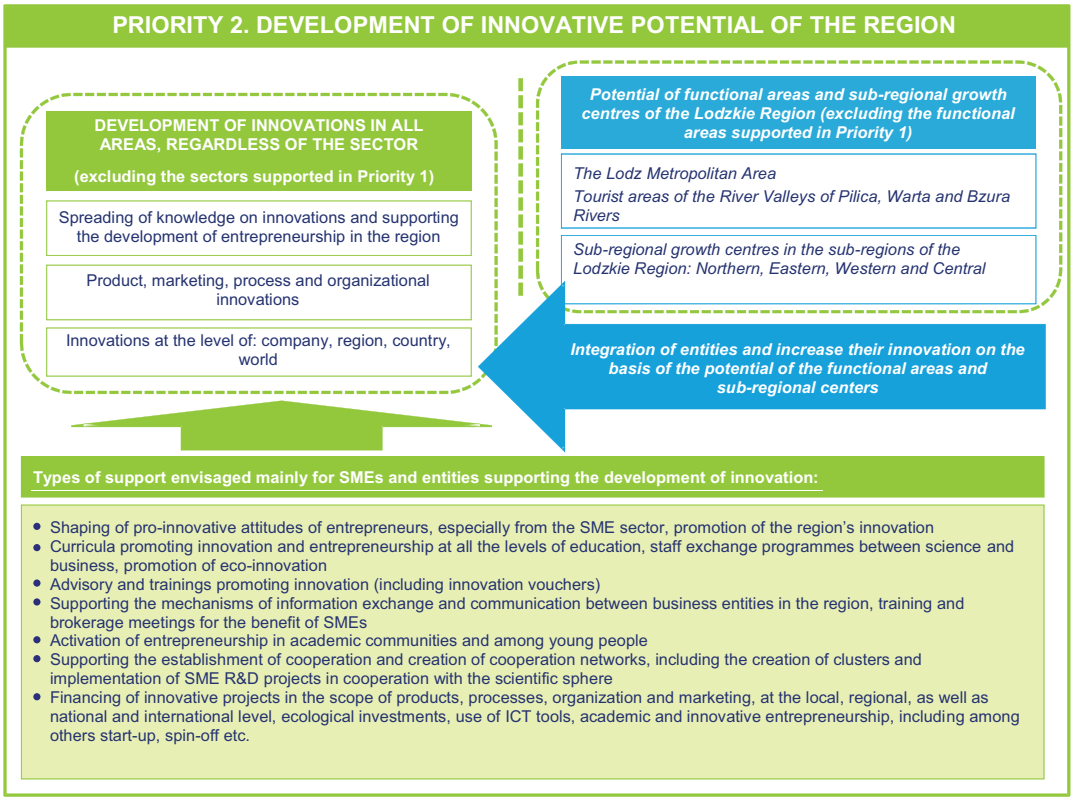
60 Ibidem

- **Planned products and results**

  - Ensuring effective sources of funding for the measures identified in the implementation of *Priority 2. Development of the region's innovative potential*.

On the following pages, a summary of the measures and the schedule of their implementation under *Priority 2. Development of innovative potential* of the region is presented.

Figure 31. Summary of measures indicated for implementation within the framework of *Priority 2. Development of innovative potential of the region*



Source: Own study.

Table 30. Schedule of implementation of tasks within the framework of *Priority 2. Development of innovative potential of the region*

	Year	2013				2014				2015				2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				2026				2027				2028				2029				2030			
	Operating objectives and measures	Quarter	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Priority II. Development of innovative potential of the region	**2.1 Raising the awareness of innovation benefits**																																																																									
	2.1.1 Creating pro-innovative attituted of entrepreneurs, especially from the SME sector																																																																									
	2.1.2 Promotion of the region's innovation																																																																									
	2.2 Promotion of knowledge on innovation and entrepreneurship																																																																								
	2.2.1 Curricula promoting innovation and entrepreneurship at all levels of education																																																																								
	2.2.2 Promotion of eco-innovation																																																																								
	2.2.3 Advisory and trainings promoting innovation																																																																							
	2.2.4 Staff exchange programmes between science and business promoting innovation																																																																							
	2.3 Platforms of experience exchange and communication																																																																							
	2.3.1 Supporting the mechanisms of information exchange and communication																																																																							
	2.3.2 Dedicated training and brokerage meetings for the development of innovation potential																																																																							
	2.3.3 Activation of entrepreneurship in academic communities and among young people																																																																							
	2.4 Promotion of cooperation of business entities																																																																							
	2.4.1 Supporting the establishment of cooperation and the creation of cooperation networks																																																																							
	2.4.2 Supporting the R&D projects in cooperation with science and business sphere																																																																							
	2.5 Financing the development of the region's innovation potential																																																																							
	2.5.1 Financial backup for the projects regarding the development of the region's innovation potential																																																																						

Source: Own study.

6.1.3. Priority 3. Managing the region's innovations

Within *Priority 3. Managing the region's innovations*, 5 operational objectives, and 14 measures within those objectives, have been selected for implementation.

Table 31. The list of operational objectives and activities within *Priority 3. Managing the region's innovations*

AREA	AWARENESS	KNOWLEDGE	COMMUNICATION	COOPERATION	FUNDING
Priority 3. Managing the region's innovations **The main beneficiaries: JST, IOB, CTT, Universities**	**3.1.** Building awareness within the environment that supports the implementation of Innovations **Measures:** **3.1.1.** Improving the knowledge and awareness of pro-innovation in the local administration **3.1.2.** Developing an innovation culture and a wider engagement of the society in the process of innovation	**3.2.** Construction of an innovation management system **Measures:** **3.2.1.** Ensuring efficient management mechanisms, implementation, monitoring and evaluation of RIS LORIS 2030 **3.2.2.** Raising the skills of human capital in the innovation system	**3.3.** Creation of a system of communication and counselling **Measures:** **3.3.1.** Building a support system of communication and counselling **3.3.2.** Platform for the exchange / transfer of knowledge / innovation **3.3.3.** Creating a system of ordering and collecting information on the results of research **3.3.4.** A platform for cooperation between institutions in support of innovation	**3.4.** Building the framework of a system encouraging cooperation and Entrepreneurship **Measures:** **3.4.1.** Supporting the system to stimulate entrepreneurship **3.4.2.** Establishing a system of technology brokers **3.4.3.** Building a system for cluster policy **3.4.4.** Supporting innovative investment inflows **3.4.5.** Developing information society services	**3.5.** Providing an integrated system of financing Innovation **Measures:** **3.5.1**. Creating a system of financing innovation in the region

Operational objective 3.1. Building awareness within the environment that supports the implementation of innovations

Measure 3.1.1. Improving the knowledge and awareness of pro-innovation in the local administration

- **The justification and the objective of the measure**

Support institutions are a key element of an innovative economy that allows activation of internal resources and making full use of local growth factors. Shaping the social and economic environment favourable to business, and favourable to undertaking business innovation, is important for economic development. To support the implementation of the Regional Innovation Strategy and strengthen the management of innovation in the region, it is necessary to improve the knowledge and awareness of pro-innovation of the staff of local administration institutions at the regional and local levels. The aim is to create a pro-innovation attitude among local government employees and building their awareness and knowledge about the role of innovation in building a knowledge-based economy.

- **Description of the measure**

In order to make the representatives of local authorities see the direct benefits of active participation in the creation of innovation centres, it is necessary to introduce pro-innovation education programmes among employees of local governments at the regional and local levels. They should include instruments, such as the dissemination of knowledge and best practices for successful innovation efforts by the administration in other regions of the country and in Europe, study visits, seminars, facilitating the exchange of experiences and gaining knowledge about available support instruments. Increasing the knowledge and competence of regional and local administrations should also include identifying opportunities to foster entrepreneurship and innovation at the local level through appropriate provisions in the preparation of local development plans, funding the creation of local centres of innovation and their promotion, preparing appropriate plans for investment and attracting investors in industries / specialisations crucial for the region. The initiatives, undertaken within the frameworks of this measure, should allow government employees to acquire knowledge of the benefits of building a favourable environment for the development of entrepreneurship and the ability to support local innovation in relation to education, promotion, handling investors and local development as well as innovative development of the public services.

- **Tasks to be implemented within the measure:**
  - Supporting programmes and projects aimed at improving the pro-innovation knowledge and awareness in government administration at the regional and local levels;
  - Supporting programmes and projects aimed at increasing the competence of regional and local administration workers through training, identifying good practices of effective measures taken by the administration in other regions of the country and Europe for innovation, study visits, seminars, facilitating the exchange of experiences and gaining knowledge of the available instruments of assistance;
  - Supporting projects concerning advisory aimed at the construction of a favourable environment for the development of entrepreneurship and the ability to support local innovation in relation to education, promotion, handling investors and local development;
  - Supporting the projects aimed at providing access to the high-standard innovative public services.
- **Planned products and results**
  - Improvement of pro-innovation knowledge and awareness in local government through the implementation of programmes and projects including initiatives in the field of training, consulting indicating the ability to create a favourable environment for the development of entrepreneurship and innovation.
  - Providing access to the high-standard innovative public services.

Measure 3.1.2. Developing an innovation culture and a wider engagement of the society in the process of innovation

- **The justification and the objective of the measure**

The low level of public trust and a lack of real partnership in the mutual relations between entities in the region is one of the main barriers for the development of the region. Therefore, it is necessary to build social capital, which will be aware of the benefits of entrepreneurship development and implementation of innovative projects. A high level of trust between people, the activity of non-governmental organisations, active social attitudes, commitment of social and economic partners and the local government, are determinants of networking and making innovative joint ventures. The culture of innovation and participation

of citizens in the social life of the region translates into a willingness to change creativity in finding solutions. The aim is, therefore, to build awareness and attitudes of pro-innovation, and delivery of knowledge about the role, as well as the benefits of innovation and cooperation in this area among the inhabitants of the region, socio-economic partners and local governments.

- **Description of the measure**

This measure aims to support initiatives increasing the level of the culture of innovation in the region, which will be aimed at encouraging the inhabitants of the lodzkie region to take an interest in the subject of innovation. It is essential to raise the awareness of the value and importance of the concept of „innovation", as well as to present the benefits of introducing innovation in everyday action. Of particular importance in this regard is the use of examples of best practices and good models from both the lodzkie region, but also from other regions of the country, from which individual group recipients of these activities could be identified. Showing positive examples of the success of innovative projects in co-operation between individuals, social organisations and local governments should be favourable to creation of positive attitude to innovation in the region. Activities in this area should also be accompanied by increased media attention of the subject of innovation, social organisation of information campaigns, designed for specific target groups, as well as various types of animation initiatives related to creating pro-innovation attitudes. An equally important element is the inclusion of a wider public in the creation of innovative policies at regional and local levels, as well as delegating some powers and responsibilities of the local government to social partners, including non-governmental organisations.

- **Tasks to be implemented within the measure:**
  - Conducting informational and promotional activities including: television, radio, Internet and press campaigns aimed at selected target groups regarding building awareness and creating a pro-innovation attitude;
  - Preparation and implementation of projects aimed at selected target groups, designed to present best practices and standards relating to the implementation of joint innovative projects, which are examples of practical measures, with which selected groups could be identified;
  - Preparation and implementation of projects for the wider involvement of the public in the creation of innovative policies at regional and local level, and delegating some powers and responsibilities of the local government to social partners, including non-governmental organisations.
- **Planned products and results**
  - Building the pro-innovation attitudes of residents and entities operating in the lodzkie region by conducting informational and promotional activities, the implementation of projects aimed at building awareness and providing knowledge of the subject of innovation.

Operational objective 3.2. Construction of an innovation management system

Measure 3.2.1. Ensuring efficient mechanisms of management, implementation, monitoring and evaluation of RIS LORIS 2030

- **The justification and the objective of the measure**

The successful implementation of the objectives of RIS LORIS 2030 calls for the establishment of institutional structures to coordinate tasks and to ensure the continuity in the implementation of RIS LORIS 2030.

The aim is to provide a permanent organisational structure, together with an indication of responsibility for the various stages of the implementation of the Strategy to selected institutions in the lodzkie region and to coordinate and monitor the progress of the works. An ongoing monitoring of the degree of implementation of the strategic and operational objectives of RIS LORIS 2030 will enable the identification of the areas that require additional support, and provide information on the possible need to update the document.

- **Description of the measure**

Adapting the organisational structure to the needs of RIS LORIS 2030 requires the Marshal's Office of Lodzkie Region to assign the responsibility for the implementation of the provisions of the document and to ensure cooperation and information flow within the Regional Innovation System. This cell should be responsible for the preparation of effective mechanisms for management, implementation and monitoring of RIS LORIS 2030. In addition, it should coordinate the tasks identified to undertake within the Strategy, and oversee the implementation of the planned tasks by the competent bodies appointed for this purpose under the Regional Innovation System as well as order and supervise the conduct of research aiming at the improvement of effectiveness of implementation of RIS LORIS 2030, including for example: the research concerning stocktaking of R&D infrastructure in the voivodeship, technological foresight for the region, diagnosing the real demand of the entrepreneurs in the region for graduates of vocational schools, technical schools and universities, etc. Ensuring the principle of partnership in the implementation of RIS LORIS 2030 also requires the inclusion of monitoring of the supervisory body, consisting of the main actors of economic life, such as: enterprises, research and scientific entities, local governments, business institutions and representatives of regional organisations in the field of innovation and technology, which will be responsible for strategic decisions regarding the implementation of RIS LORIS 2030. The adequate empowerment of individual entities in the management, implementation, monitoring and evaluation system of the RIS LORIS 2030 will also be an important issue in this area.

- **Tasks to be implemented within the measure:**
  - Appointment of entities to the organisational structure for implementation, monitoring and evaluation of the RIS LORIS 2030;
  - Indication of the responsibilities of the various institutions in the Regional Innovation System;
  - Identification of the division of tasks within the main processes carried out in the framework of RIS LORIS 2030;
  - Developing a process, method and schedule for monitoring the progress of implementing the RIS LORIS 2030, the system of reporting and implementation of tools to gather information in this regard;
  - Preparation of tools for conducting periodic evaluations and analyses of the RIS LORIS 2030 implementation, and developing the communication principles of the analyses and assessment results to stakeholders, and in particular - the RIS LORIS 2030 management structures;
  - Development of the principles of giving prognosis and implementation of changes into the RIS LORIS 2030 as a result of research results and communicating them to the stakeholders of the strategy;
  - Conducting and supervising research aiming at improving the efficiency of implementing RIS LORIS 2030.

- **Planned products and results**

  - An established organisational structure with a clear division of responsibilities of the various institutions for the implementation, monitoring and evaluation of the RIS LORIS 2030;
  - Monitoring tools and methods for collecting information on the progress of the implementation of RIS LORIS 2030;
  - Periodic evaluation and analyses of the implementation of RIS LORIS 2030;
  - RIS LORIS 2030 upgrade policies and communicating the changes to the stakeholders of the strategy.

Measure 3.2.2. Raising the skills of human capital in the innovation system

- **The justification and the objective of the measure**

The low level of local government qualifications and insufficient skill level of the representatives of business environment institutions working in the area of innovation are one of the barriers indicated by the entrepreneurs as a part of the support of the implementation of innovative projects. Raising the skills and qualifications of the staff making up the Regional Innovation System is therefore crucial in order to ensure the smooth and efficient implementation of RIS LORIS 2030. The specificity of this area requires constant acquisition of knowledge and updating of the previously learned skills in this fast-growing field of innovation. The main aim is to improve the quality and efficiency of services in the implementation of RIS LORIS 2030 by providing increased knowledge and skills required of the staff in selected areas of implementation of RIS LORIS 2030. Gaining skills and ensuring an adequate level of competence will effectively anticipate, initiate and support all the measures for the development of innovation policy in the region.

- **Description of the measure**

Support under this measure will be directed at employees of entities operating in the framework of the Regional Innovation System, i.e. business environment institutions, representatives of the scientific sector, economic and social partners and other entities performing tasks for the implementation of RIS LORIS 2030. Programmes and projects implemented under this measure will enable the improvement of the quality of advisory and training services offered by the various entities in the Regional Innovation System. Increasing the knowledge and skills of the employees implementing the RIS LORIS 2030 should include specialised trainings, study visits, courses, workshops and seminars, allowing for the exchange of experience and to acquire and expand of knowledge of the available tools of innovation support, and best practices within the scope of use of selected instruments including technology transfer, intellectual property protection, the specific sources of financing the various stages of the innovation process, etc. It is also necessary to provide an internal training system between the entities involved in the system of implementation of the RIS LORIS 2030, which have expertise in certain areas, which will lower the costs of the measure. All proposed instruments of support and forms of improving skills should result from the analysis of the needs of workers operating in the framework of the Regional Innovation System.

- **Tasks to be implemented within the measure:**

  - Analysis of the needs of workers operating in the framework of the Regional Innovation System regarding their training needs and the areas of the development of skills;
  - Preparation of the principles and implementation of a system of internal training among the institutions involved in the implementation of RIS LORIS 2030;

- Preparation and implementation of projects and programmes aimed at enhancing the knowledge and competence of the workers responsible for the implementation of RIS LORIS 2030.

- **Planned products and results**

  - A system of internal trainings among the institutions involved in the implementation of RIS;
  - Improving the quality and efficiency of services regarding the implementation of RIS LORIS 2030 through the execution of programmes and projects aimed at improving the knowledge and skills of employees involved in the implementation of RIS LORIS 2030.

Operational objective 3.3. Creation of a system of communication and counselling

Measure 3.3.1. Building a support system of communication and counselling

- **The justification and the objective of the measure**

Poor network relations, high customisation of individual entities, uneducated forms and channels for exchanging information, knowledge and experience, lead to the fragmentation of the system of innovation. This problem is further amplified by the lack of a strong leader and initiator in the region, an entity performing motor functions in the regional innovation system.[61] Strengthening of the coordination and integration of activities stimulating innovation in the lodzkie region requires the establishment of a sustainable system of institutions that will be the main actors in the innovation processes. The process of its construction will take into account the specific measures to be implemented in the RIS LORIS 2030, as well as the type of entities that are covered by the support. The aim is to provide access to information and counselling, as well as streamlining the communication process in the Regional Innovation System through the establishment of an institutional system for the implementation of RIS LORIS 2030.

- **Description of the measure**

For an entrepreneur wishing to obtain information on the possible development of innovative projects, the most important issue is the availability of such information, and easy identification of entities, from which he will be able to get the right support. Therefore, one of the most important issues is to build a transparent and clear institutional system supporting the development of innovation that will ensure proper information flow and consulting support necessary for the entities involved. From the point of view of the entrepreneur, an easy identification of the entity, to which he / she may report the chosen issue and obtain precise information regarding the available support is crucial.

This system will be based on 3 main groups of entities responsible for direct contacts with companies in the area of innovation, that is:

- Network of 22 business environment institutions available at the level of each county intended to support SMEs. It will constitute the first point of contact for companies within the individual counties, where entrepreneurs will be able to obtain advisory and training support, as well as

61 Materials of „Partnerska sieć współpracy i wymiany doświadczeń dotyczących interwencji w ramach PO Kapitał Ludzki wspierających realizację Regionalnych Strategii Innowacji INTREGRISNET" Marshal's Office of the Lodzkie Region, Department of Human Resources, February 2012, p. 92

obtain information about possible sources and methods of financing innovative projects. Entities established in the network will also be responsible for creating platforms for exchange of experience at the level of functional areas and sub-region growth centres in particular sub regions of lodzkie region. The network should be established on the basis of the business environment institutions already existing in the counties.

- A network of coordinators for regional specialisations - entities selected to coordinate the support for the entities operating within the frameworks of the regional specialisations in individual industries. Within the frameworks of the created networks, the Coordinators will be responsible for building knowledge generated in the areas of specialisation and will direct to the appropriate R&D entities operating in the region in the chosen specialisation. They will also provide assistance in establishing cooperation between universities and companies, both nationally and internationally, in the area of specialisation (including, among others, in finding potential business partners from abroad for companies operating in the areas of specialisation, organising direct bilateral meetings of entrepreneurs, helping in the organisation of business missions and / or participation in international trade fairs, assisting in establishing contacts with foreign universities and their research centres, organising collaborative meetings for entrepreneurs).
- Network of Technology Transfer Centres – the entities responsible for communication between companies and scientific institutions in the region and advice within the scope of technology transfer, as well as other forms of cooperation between business and science. These centres will build knowledge resources generated in their native entities and other R&D entities operating in the region. They will also provide assistance in establishing cooperation between universities and companies, both nationally and internationally, and activate and support the processes of technology transfer between science and business, as well as prepare the offers of specialised services in the field of technology transfer for entities from functional areas, sub-region growth centres in particular sub regions of Lodzkie Region and key industries / specialisations.

As a part of the preparation of the system and the scope of the responsibilities and support for each network, it is essential to provide comprehensive and high quality services provided by selected groups. It is also necessary to connect each network, as well as to ensure the flow from the other entities that will be an integral part of the Regional Innovation System, that is science and technology parks, business incubators, financial institutions providing assistance under the loan, guarantee, and others funds. Building a system for sharing information between the institutions involved in the regional innovation system will be benefiting from support under *Measure 3.3.4. A platform for cooperation between institutions in support of innovation*.

Creating individual networks will lead to the gradual standardisation of services over time, it will make it possible to better identify the needs of entrepreneurs in the various groups.

- **Tasks to be implemented within the measure:**
  - Preparation of the concept of operation of individual networks;
  - Preparation of a programme for financing within the system for individual networks aimed to ensure their sustainable operation over a long period of time, and human and financial resources;
  - Establishment of a system of institutions and implementation of system projects involving filling the tasks assigned within each network.

- **Planned products and results**

  - Establishment of a network of 22 business support institutions available at the level of each county;
  - Establishment of a network of regional specialisations;
  - Establishment of a network of Technology Transfer Centres;
  - Improvement of communication and information flow, and providing effective advice through the implementation of system projects.

Measure 3.3.2. Platform for the exchange / transfer of knowledge / innovation

- **The justification and the objective of the measure**

An important element to enhance the effectiveness of the implementation system is to provide access to comprehensive and current information on the activities carried out by individual entities operating in the RIS LORIS 2030. Lodz Knowledge Transfer Platform has been made available by the Lodzkie Region Government, the aim of which has been to provide the main point of collection and exchange of information in the field of innovation in the region. Therefore, the aim is to provide the maintenance and development of the Lodz Knowledge Transfer Platform, so that it is a social networking site for entrepreneurs, representatives of science, and other subjects involved in the sphere of innovation, and that it is a source of information and a communication tool, supporting the Regional Innovation System.

- **Description of the measure**

The electronic platform – the Lodz Knowledge Transfer Platform, the main place of gathering and exchange of information for the lodzkie region about the innovative needs of the local business, the offer of scientific, research and technology institutions, sets of „good practices" in the field of innovation and technology transfer. This platform should enable:

  - Common and free access to all entities from the region, interested in innovation;
  - Publishing information on the platform, regarding the conducted business, demand for information, seeking partners to cooperate, by any entity;
  - Establishing contacts with other entities in the voivodeship, as sources of innovation, partners in the processes of innovation, pro-innovation services;
  - Contact with platforms from other regions and other countries (the EU);
  - Publishing current information on the activities carried out in the region of RIS LORIS 2030;
  - Creation of the main source of information about the system of business support institutions in the RIS LORIS 2030, i.e. a network of 22 business environment institutions, a network of Technology Transfer Centres, a network of coordinators within the regional specialisation, business incubators, science and technology parks, etc., and the services available in these institutions;
  - Creation of an interactive tool for communication between the institutions involved in the Regional Innovation System;
  - Creation of an interactive tool for obtaining information from entities registered on the platform;
  - Publishing and presentation of information in relation to the specialisation of the region and the functional areas as well as sub-region growth centres in particular sub regions of lodzkie region;

- Searching for the institutions responsible for supporting the company with the defined criteria;
- Build a platform based system of ordering and collecting information about the results of research;
- And other features defined on the basis of demand submitted by the platform users.

It is also necessary to appoint a coordinator who will be responsible for the implementation of information and coordinating the contacts between the users of the platform.

- **Tasks to be implemented within the measure:**
  - Identification of areas for the expansion of the Lodz Knowledge Transfer Platform in relation to the opportunities to support the entities and tasks within the Regional Innovation System with its functionalities;
  - Preparation of a project regarding the funding opportunities and expansion of the Lodz Knowledge Transfer Platform;
  - Appointment of a coordinator of activities carried out under the Lodz Knowledge Transfer Platform;
  - Execution of the project for the expansion of the Lodz Knowledge Transfer Platform;
  - Running the promotion and dissemination of information regarding the Lodz Knowledge Transfer Platform.
- **Planned products and results**
  - A list of the functionalities of expansion of the Lodz Knowledge Transfer Platform relating to the possibility of supporting entities and tasks within the frameworks of the Regional Innovation System;
  - Project for the development of the Lodz Knowledge Transfer Platform;
  - Coordinator of the measures conducted under the Lodz Knowledge Transfer Platform;
  - The expansion and development of the Lodz Knowledge Transfer Platform and its promotion.

Measure 3.3.3. Creating a system of ordering and collecting information on the results of research

- **The justification and the objective of the measure**

Among the universities in the lodzkie region, two key problem areas, affecting the system of commercialisation of knowledge and technology, have been identified. The internal problem, which relates to the universities' acquisition of information about their own potential knowledge. This problem is linked, among other things, to a large dispersion of information about the knowledge and technologies that can be commercialised in a number of ways (it is available at the level of research teams and chairs, but not at the central level). The external problem refers to the creation and improvement of information systems presenting the offer of universities and other entities of R&D to the outside. The existing systems are selective and have limitations in their functionality in terms of use by entrepreneurs. Therefore, there is a need to create a system of ordering and collecting information on the results of research carried out in the universities of the region, as well as information about their offer regarding the conducted research and development for the companies. This measure will aim to better use the research potential of the region in the regional economy.

- **Description of the measure**

Effective use of the research potential of the region requires the creation and improvement of information systems presenting the offer of universities and the R&D entities and presents the prepared offer to entrepreneurs. The process of identifying the existing and developed intellectual property components and their evaluation for possible commercial use is time consuming and requires high professional and interpersonal skills. Therefore, it is essential to support the creation of internal systems for the acquisition of knowledge about the effects of research and evaluation of the commercial potential within the universities in order to translate the information into the business language and to carry out a preliminary analysis of the market suitability of the research results. It is equally important to adjust the theme of master's theses and doctoral dissertations to the needs of the regional economy. For this purpose, it is necessary to link the demand for scientific work reported by companies to the choice of desired topics for undergraduate and graduate students. A wide dissemination of information about such opportunities among companies, as well as students and scientific workers, will also be an integral element in this area.

- **Tasks to be implemented within the measure:**
  - The concept of a comprehensive scientific ordering system in universities and the presentation of their offer in the conduct of research and development for enterprises based on the Lodz Knowledge Transfer Platform;
  - Identification of responsibilities for the entity coordinating the Lodz Knowledge Transfer Platform and entities supplying the substantially ready system;
  - Promotion of ordering scientific works and the use of the offers of universities in the business environment;
  - Association of potential contractors and entrepreneurs contracting the works;
  - Supporting projects regarding the creation of internal systems for acquiring knowledge about the effects of research and evaluation of the commercial potential of the universities;
  - Supporting projects for the development and improvement of internal systems of universities within the scope of preparation of information resources presenting the universities' offer of technology transfer.
- **Planned products and results**
  - The system of ordering scientific works in universities and the presentation of their offers in the conduct of research and development for enterprises based on the Lodz Knowledge Transfer Platform;
  - Responsibilities of the entity coordinating the Lodz Knowledge Transfer Platform and the entities supplying the substantially ready system;
  - Promotion of ordering scientific works and using the offers of universities in the business environment;
  - Better use of the research potential of the region in the regional economy by supporting projects for the creation of internal systems.

Measure 3.3.4. A platform for cooperation between institutions in support of innovation

- **The justification and the objective of the measure**

Enterprises, public administration, R&D institutions and centres of innovation - operate in the lodzkie region in relative isolation and do not know much about the each other's offer and the needs of other parties. Only close cooperation between institutions can increase the effectiveness of the undertaken pro-innovative activities and enable synergy. Therefore, it is necessary to create a platform for cooperation between the institutions that support innovation, and to coordinate the activities in order to ensure better communication and information flow between the institutions involved in the implementation of RIS LORIS 2030.

- **Description of the measure**

Within this measure, the assistance should include the initiatives aiming to intensify contacts and meetings of institutions that support innovation, providing: mutual knowledge of the activities of the various institutions, discussion of plans of the current deals available for businesses, providing information about the experiences related to the implementation of the projects, undertaking joint promotional and informational initiatives targeted at a comprehensive access of entrepreneurs to the information about the institutions and services in the region, periodic discussion meetings, a forum for the exchange of good practices, to initiate cooperation in the framework of the new ventures, etc., standardisation of selected pro-innovation services, pro-innovation projects implemented jointly (in consortium), benchmarking of activities and their results. The cooperation of institutions in the Regional Innovation System should allow not only the creation of common, comprehensive services, but also to guarantee the identification of existing market niches, leading to a wider range of brand new items. A key role in the creation of the platform is played by the Regional Government of the Lodzkie Region, which should coordinate the activities taken by individual institutions in the RIS LORIS 2030. The instrument to support mutual cooperation and exchange of information between the institutions of the system will be the creation of a concept of operation of such a platform, using the existing tools, including the Lodz Knowledge Transfer Platform.

- **Tasks to be implemented within the measure:**
  - Preparation of the concept of operation of the platform of cooperation between institutions that support innovation, including identification of tools and instruments allowing to support the platform of cooperation between institutions that support innovation;
  - Preparation of programmes and projects aimed at ensuring the cooperation between institutions supporting innovation within the platform.
- **Planned products and results**
  - The concept of a platform of cooperation operating between institutions that support innovation;
  - The implementation of programmes and projects aimed at ensuring cooperation between institutions supporting innovation within the platform.

Operational objective 3.4. Building the frameworks of a system encouraging cooperation and entrepreneurship

Measure 3.4.1. Supporting the system to stimulate entrepreneurship

- **The justification and the objective of the measure**

The primary course of measures to support the development of entrepreneurship are business incubation programmes that are implemented in preincubators and academic, entrepreneurship and technology incubators. Incubations of entrepreneurship include a comprehensive set of measures aiming to promote entrepreneurs and new business development processes from the concept stage to market independence. The aim is to stimulate entrepreneurship in the lodzkie region by providing support to organisations dedicated to aspiring entrepreneurs in the sector of micro, small and medium-sized enterprises that have just started up or are wishing to start a business such as: academic accelerators and incubators, technological incubators and science and technology parks.

- **Description of the measure**

This measure will support initiatives aimed at creating attractive conditions for conducting business within the scope of ensuring the provision of comprehensive consulting and training services, and providing the necessary infrastructure to undertake economic activity. Firstly, the tasks regarding the comprehensive support of potential entrepreneurs should be carried out, from the evaluation of the idea, through guidance in the creation of the new company to gaining market independence, using the infrastructure currently available in the region. An important aspect in this regard is also providing financial assistance for the preparation and further development of the idea, as well as evaluating opportunities and identifying alternative sources of financing the projects with the use of private funds. Secondly, it is necessary to support projects involving development of the infrastructure (they should always be justified by a detailed analysis of the needs of entrepreneurs and include their declarations regarding the use of the proposed infrastructure). In addition, an integral part of the support programmes and projects should be training to acquire the necessary competence of would-be entrepreneurs, including, among other things:

  - Preparation of business plans, preparation and evaluation of investment projects;
  - Strategic management of business, marketing and public relations, financial management and the servicing of finances and accounting;
  - Legal regulations within the frameworks of the subject of the planned operations (including the protection of copyright, patents, analysis of the idea);
  - And others, necessary from the point of view of business.

- **Tasks to be implemented within the measure:**
  - Supporting programmes and projects to improve the offer of institutions and of a network of business development service providers in the lodzkie region;
  - Supporting investment projects in infrastructure development for enterprise development;
  - Supporting complex projects in the field of business development for the support of potential entrepreneurs from the evaluation of the idea, through guidance in the creation of the new company to market independence;
  - Supporting promotional activities aiming to disseminate information about funding opportunities for start-up and development of innovative companies.

- **Planned products and results**

  - Encouraging entrepreneurship of the region through the implementation of programmes and projects including the improvement and provision of comprehensive consulting and training services during the start-up and business development phases;
  - Promotion of entrepreneurship and dissemination of information about funding opportunities for start-up and development of innovative companies.

Measure 3.4.2. Establishing a system of technology brokers

- **The justification and the objective of the measure**

Knowledge of innovative technology solutions and innovation among entrepreneurs is negligible. This is due to the lack of the skilled workers and experts capable of conducting the innovation policy of the company. In the lodzkie region, there are no specialised entities dealing with the commercialisation of R&D works and specialised in liaising with stakeholders in the field of technology transfer, for example, on the principles of a promoter. Therefore, there is a need to create a system of technology brokers, acting alongside key institutions, dealing with these issues in the region. The aim is to build a system of qualified staff and experts activating the cooperation of science and business, and to support the establishment of partnerships between providers and consumers of new technological solutions.

- **Description of the measure**

Support under this measure will contribute to the preparation of the staff of the most important institutions for handling of technology transfer processes in the region through acquiring knowledge and practical skills in a series of training courses, workshops and study visits. The acquisition of relevant skills will enable brokers to carry out the tasks which include:

  - Advice on the protection of industrial property rights and marketing rights for licensing agreements, developing models of commercialisation of intellectual property;
  - Making a quantitative and qualitative assessment of the market value of intellectual property, market analysis, and the evaluation of the implementation of innovative technologies;
  - The diagnosis of the current state of the technology and checking for the presence of competing technologies on the market, searching for customers for developed innovative products and technologies;
  - Consultancy and audits in the field of innovation and technology transfer;
  - Promotion of innovative technology services and products, the establishment of partnerships between providers of new technological solutions and companies interested in their implementation, particularly in the key sectors / areas of specialisation as well as the functional areas and the sub-region growth centres in particular sub regions of lodzkie region.

Technology brokers will also support the organisation of training and brokerage meetings, and will act as advisors in the process of establishing cooperation between entrepreneurs and scientific institutions in the field of technology transfer.

- **Tasks to be implemented within the measure:**

  - Identification of entities and staff, which should be covered with the support under the creation of the system of technology brokers;

- Selection of the institution responsible for preparing the project for the creation of a system of technology brokers;
- Implementation of the project for the creation of a system of technology brokers;
- Consulting, support and conducting brokerage and training meetings, provided by technology brokers.

- **Planned products and results**

  - A list of entities and staff, which should be included in the support under the creation of the system of technology brokers;
  - The institution responsible for preparing the project for the creation of a system of technology brokers;
  - Implementation of the project for the creation of a system of technology brokers;
  - A system of qualified staff and experts activating the cooperation of science and business, and supporting the establishment of partnerships between providers and consumers of new technological solutions.

Measure 3.4.3. Building a system for cluster policy

- **The justification and the objective of the measure**

Creating networking is one of the key elements shaping the innovative character of the region. A key aspect in this process is cluster structures. The development of the cluster initiatives gives the potential for effectively increasing competitiveness and building an innovative economy in the region. In the lodzkie region, a low level of development and intensity of actions within the clusters is still visible. Therefore, it is necessary to take further measures to stimulate the creation and development of clusters in the region by conducting a regional cluster policy.

- **Description of the measure**

The regional cluster policy should be a permanent component of innovative development based on the model of open networks and the management of the flow of resources within cooperative entities and entities outside the sphere of science and research. Cluster support programmes should follow the guidelines set out in the framework of a comprehensive policy for the lodzkie region, prepared in this regard. It is also important to prepare mechanisms aimed at building functional and dynamic cluster structures associated with the R&D institutions for the smooth transfer of innovative solutions, with particular emphasis on key industries / regional specialisations and defined functional areas of the region as well as the sub-region growth centres in particular sub-regions of lodzkie region.

- **Tasks to be implemented within the measure:**

  - Creating a map of potential clusters in the region, especially with regard to clusters within the area of selected regional specialisations as well as functional areas and sub-region growth centres in particular sub-regions of lodzkie region;
  - Preparation of a cluster development plan and the development of training and advisory, and financial support system for clusters;
  - Development of a system for evaluating and monitoring the development of clusters in the region, with particular emphasis on key clusters;

- Preparation of a cluster development policy, exploiting the potential of and in cooperation with the Lodz Special Economic Zone;
- Designation of the entity responsible for the coordination of cluster policy in the region and the support provided to clusters;
- Promotion and dissemination of knowledge about clustering - the principles of organisation, cooperation mechanisms, solving specific problems - so that entities who want to set up a cooperation network can benefit from the experience of others.

- **Planned products and results**

  - Cluster development policy in the Lodzkie Region, taking into account the key clusters and using the potential of the Lodz Special Economic Zone;
  - An entity responsible for the coordination of cluster policy in the region and the support provided to clusters;
  - A system for evaluating and monitoring the development of clusters in the region, with particular emphasis on key clusters;
  - Promotion and dissemination of knowledge about the clustering and provision of training and advisory, and financial support system for clusters.

Measure 3.4.4. Supporting innovative investment inflows

- **The justification and the objective of the measure**

The inflow of foreign investments in the region can significantly affect and stimulate the development potential of the regional specialisations. An important aspect in this regard is the assurance of complementarity between the activities of the RIS LORIS 2030 and the activities in the Lodz Special Economic Zone and the individual municipalities and counties. The aim is to increase the value of foreign investments in the economic structure of the lodzkie region, especially in the sectors identified as areas of potential strategic development, through the construction of a comprehensive approach to the investment policy pursued in the region and the development of the ability to build an integrated system to support innovation and promote foreign investment.

- **Description of the measure**

The essence of the proposed measure is two main areas of support. The first one concerns the preparation of a comprehensive approach to the investment policy pursued in the region including: preparation of a comprehensive investment offer for the entire region, conduct of intensified efforts to attract investors in the industries with the greatest potential for innovation and development and support of the local government at the stage of the proceedings of potential investors, preparation of a code of good practices in this area, preparation of investment areas, creation of incentives for potential investors, as well as coordination of tasks in the area of investment policy at the regional level. The second component is the development of the ability to build an integrated system to support innovation and the promotion of foreign investment in the region, especially through: supporting training programmes for local governments to raise awareness of the approach to the investment policy pursued in the region, becoming familiar with the best practices in the field of acquiring and handling investors, as well as the ability to create incentives for potential investors. Both components should be implemented in parallel and form one comprehensive project.

- **Tasks to be implemented within the measure:**
  - Preparation of a comprehensive approach to the investment policy pursued in the region, exploiting the potential of the Lodz Special Economic Zone;
  - Identification of groups of potential foreign investors in relation to the selected areas of regional specialisation as well as the functional areas and sub-region growth centres in particular sub regions of lodzkie region, to which the information and promotion campaign should be addressed in order to recruit them to the region;
  - Preparation of a comprehensive offer of investment for the entire region;
  - Preparation of investment areas;
  - Designation of the entity responsible for coordinating the investment policy pursued in the region;
  - Conducting informational and promotional campaigns directed at the identified groups of potential foreign investors;
  - Supporting training programmes and advisory services for local governments aiming to raise awareness of the approach to the investment policy pursued in the region and to create incentives for potential investors.
- **Planned products and results:**
  - A comprehensive offer of investment for the entire region, exploiting the potential of the Lodz Special Economic Zone;
  - An entity responsible for coordinating the investment policy pursued in the region and providing support to clusters;
  - Information and promotion campaigns targeted at the identified groups of potential foreign investors;
  - Prepared investment areas;
  - Implementation of training and advisory programmes for the local government aiming to raise awareness of the approach to the investment policy pursued in the region and to create incentives for potential investors.

Measure 3.4.5. Developing information society services

- **The justification and the objective of the measure**

The level of innovation in the region is inextricably linked to the issue of access to infrastructure in the field of information and communication technologies (ICT), as well as the level of use of these technologies. They determine the efficiency of management in both the private and the public sector. The quality and availability of modern services in the information society is necessary for the dynamic development of the digital market. This is a promising area of new types of products, services and transactions, responding to the demand associated with the use of modern means of communication and technology, but also creating new markets for goods and services. The aim is to increase innovation and competitiveness of the economy of the lodzkie region through the expansion of information society services, both in terms of modern infrastructure, as well as products and services in the digital economy.

- **Description of the measure**

As a part of this measure, assistance will be directed both at infrastructure development of information and communication technology, which is necessary for the development of the Polish information society, as well as expanding access to e-services at both the local government administration level, and the development and improvement of ICT skills among the residents and entrepreneurs of the region. Initiatives taken under the measure should be aimed at increasing the efficiency and innovativeness of companies in the region with the use of ICT tools, as well as facilitating communication, information flow and the establishment of cooperation between companies through the use of information and communication technologies. It is equally important to direct support for the dissemination of solutions within the local government regarding: electronic services for investors and the public, providing access to digital information repositories and interactive tools of communication between the local governments and the citizens.

- **Tasks to be implemented within the measure:**
  - Supporting and coordinating programmes and projects for the development of the telecommunications infrastructure, including broadband networks in the voivodeship;
  - Supporting programmes and projects concerning the promotion and expansion of the range of e-services and increase of their availability;
  - Supporting programmes and projects for the development of ICT skills among the residents and entrepreneurs of the region;
  - Supporting programs and projects aimed at promoting the use of ICT by SMEs.
- **Planned products and results:**
  - Increasing the innovation and competitiveness of the economy by supporting the implementation of programs and projects for the development of the telecommunications infrastructure, the development of e-services and promotion of the use of ICT among the residents and entrepreneurs of the region.

Operational objective 3.5. Providing an integrated system of financing innovation

Measure 3.5.1. Creating a system of financing innovation in the region

- **The justification and the objective of the measure**

To allow for the implementation of activities and projects within the RIS LORIS 2030, it is necessary to ensure an appropriate integrated system of financing innovation, which will include a variety of funding sources depending on the type of undertaken measures. In the lodzkie region, there are many scattered institutions supporting entrepreneurs in seeking external funding to conduct investment and current activities, such as guarantee funds, surety funds, loan funds and business angels. However, the use of these instruments by companies is negligible due to the very limited access to information and knowledge of the specifics of individual instruments and institutions which offer this kind of support. There is also a lack of established tools to support projects with a high level of risk, i.e. highly innovative projects. The aim is to build an integrated system of financing and its promotion, in order to facilitate the implementation of innovative projects at various stages of their development, with the use of external financial instruments.

- **Description of the measure**

Measures to be implemented in the RIS LORIS 2030 can be funded from a variety of sources, i.e. EU funds, guarantee funds, surety funds, loan funds and business angels. Therefore, there is a need to develop guidelines for a comprehensive system of financial support for the implementation of the RIS in the lodzkie region, which will allow to identify and adapt the sources to the type of projects, depending on stage of their development. On this basis it will be possible to prepare guidelines for the funding of the appropriate instruments from the resources of the ROP of the Lodzkie Region for years 2014-2020 and other programs at national level.[62] The key issue in building the support instruments within the ROP of the Lodzkie Region will be the analysis of the gaps in the funding of innovation in the region at both the individual stages of the innovation and the conditions for the use of the instruments and the limitations associated with them. As a part of this measure, there should be prepared assumptions pertaining to:

  - Supporting the construction of tools such as loan, guarantee and surety funds in the region;
  - Creation of a fund for high-risk innovation;
  - Building a system of financing at selected stages of the implementation of the innovation and to ensure continuity of funding of the projects;
  - Mobilizing the banking and non-banking sector to create specialized SME support instruments;
  - Using the instruments of public-private partnerships to implement innovative projects.

- **Tasks to be implemented within the measure:**

  - Carrying out a detailed qualitative and quantitative analysis of the available sources of financing, and the development of a matrix of fulfillment of needs with an indication of the funding gaps in the region;
  - Developing a program of development of financial instruments to support the development of innovation, based on the assumptions of the RIS LORIS 2030;
  - Consulting of the prepared objectives and instruments of support with potential beneficiaries;
  - Adapting the objectives and priorities of the ROP of the Lodzkie Region for years 2014-2020 to create a system of financing innovation within the RIS LORIS 2030;[63]
  - Monitoring of the RIS LORIS 2030 financial support system and its effectiveness in the direction of meeting the needs for the development of innovation in the lodzkie region and the execution of repeatable qualitative and quantitative research, regarding the supply and demand for financial support instruments

- **Planned products and results**

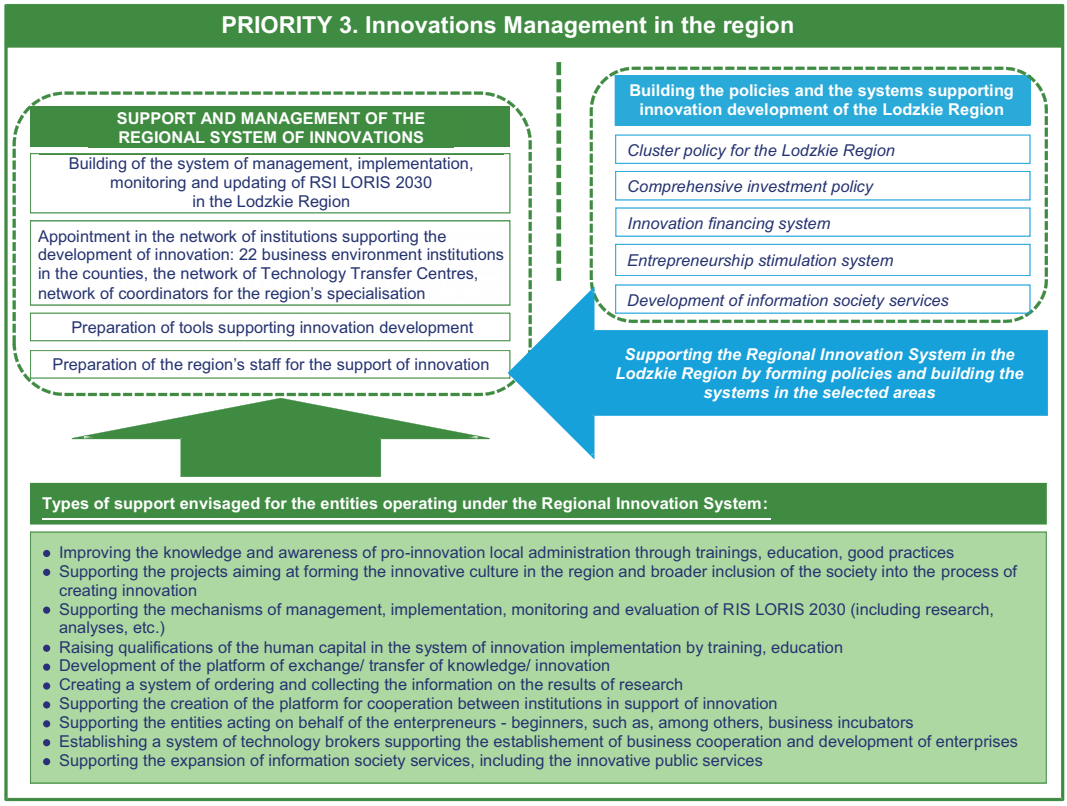
  - Provision of an effective system of financing innovation within the RIS LORIS 2030.

The following pages present the Appendix containing the summary and the schedule of tasks indicated for implementation within the framework of *Priority 3. Innovations Management in the region.*

62 Taking into account the demarcation line between national and regional programs financed by the European Union.

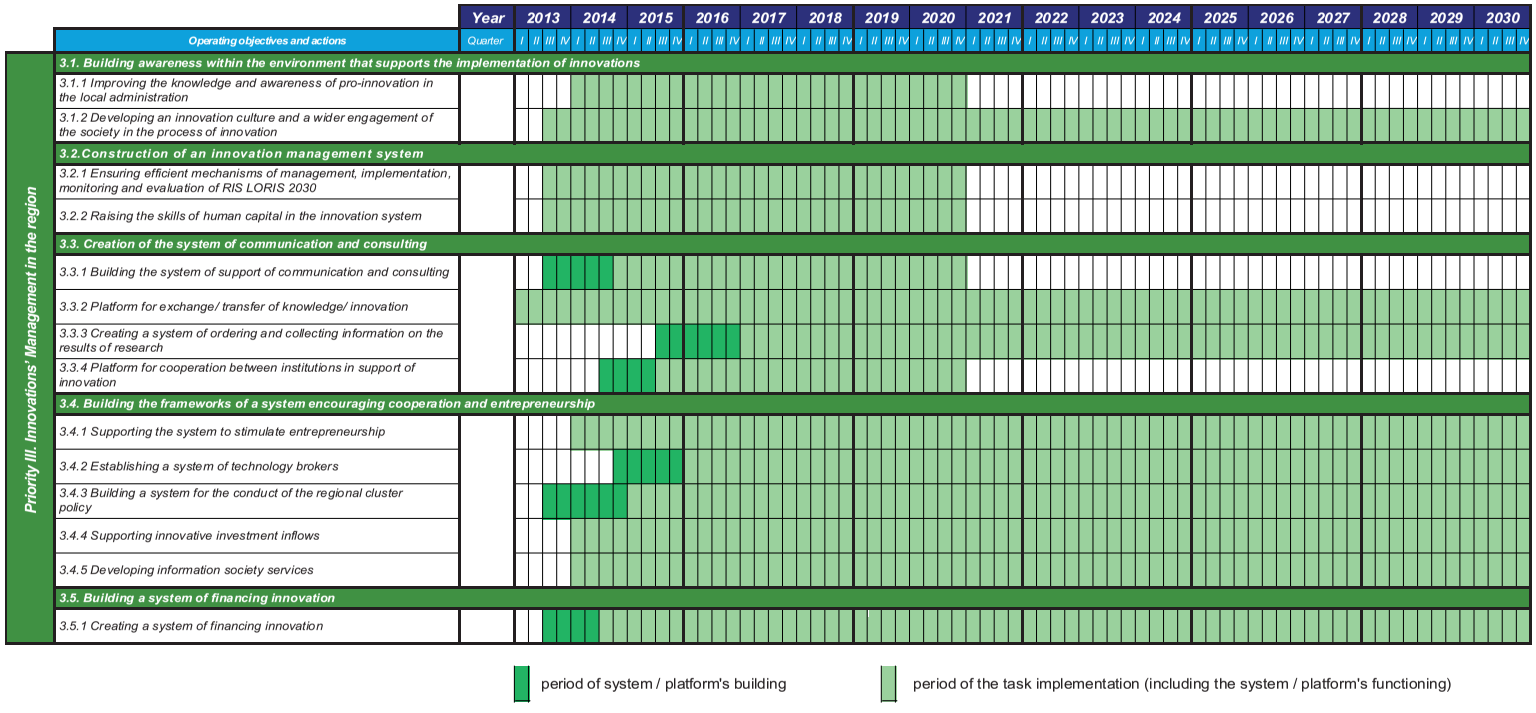
63 Taking into account the demarcation line between national and regional programs financed by the European Union.

Figure 32. Summary of the tasks indicated for implementation within the framework of *Priority 3. Innovations Management in the region*



Source: Own study.

Table 32. Schedule of implementation of tasks within the framework of *Priority 3. Innovations Management in the region*



Source: Own study.

Chapter 7

Regional Innovation System

Regional Innovation System in the lodzkie region

The System of implementation of the Regional Innovation Strategy in the lodzkie region

HUMAN CAPITAL
NATIONAL COHESION STRATEGY

Lodzkie Region

EUROPEAN UNION
EUROPEAN
SOCIAL FUND

7. Regional Innovation System

7.1 Regional Innovation System in the lodzkie region

Creating a Regional Innovation System must be correlated with the objectives of the innovation policy of the country, which in turn are a part of a broader framework and guidelines set at the level of all the Member States of the European Commission.

At the national level, a number of institutions are responsible for the measures to improve innovation. They are both selected government departments such as i.a.: the Ministry of Regional Development, Ministry of Economy, Ministry of Science and Higher Education, the Ministry of National Education, but also the Polish Agency for Enterprise Development and others. They are responsible for creating the appropriate financial instruments and the legal framework, which in turn have a direct impact on the creation of a climate for innovation in different regions of the country.

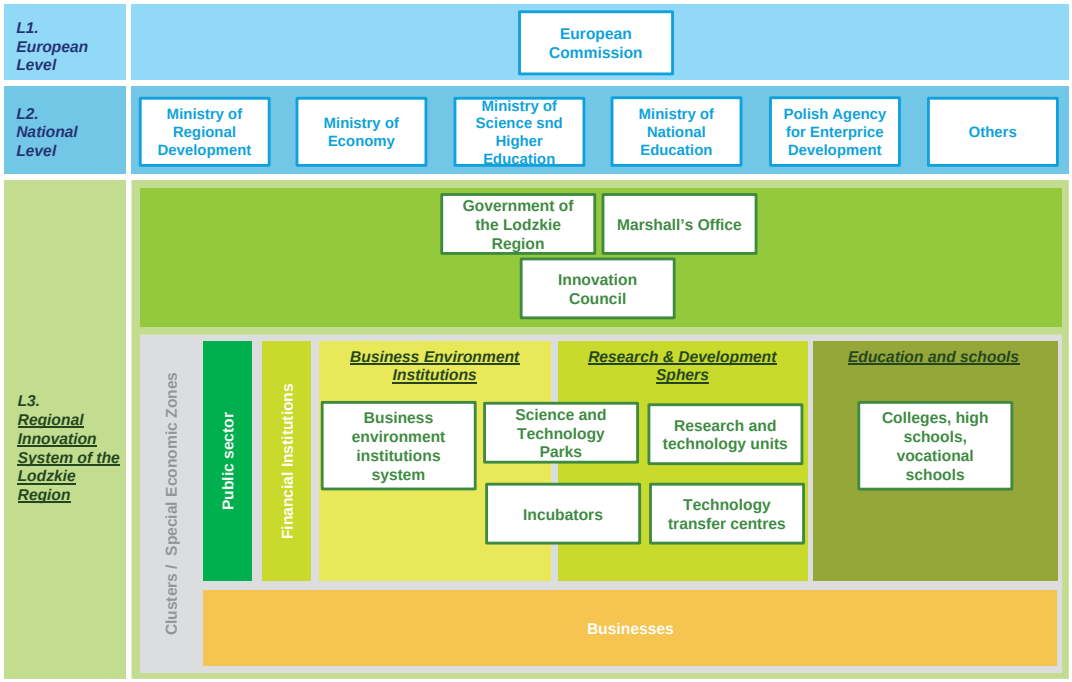
Ensuring consistency at the level of the lodzkie region with the innovation policies at national and European level is a challenge for the institutions responsible for the creation of the innovation system in the region.

Strategic institutions of the region, i.e. the Regional Government of the Lodzkie Region, the selected units of the Marshal's Office in Lodz, and the advisory body especially set up for the implementation of RIS of the Lodzkie Region - the Council for Innovation, should be responsible for ensuring complementarity of measures between the levels.

Due to the scale of the measures carried out, envisaged in the implementation of RIS of the Lodzkie Region, the key challenge will be to maintain consistency in operations. For this purpose, it is necessary to involve all communities making up the Regional Innovation System in the Lodzkie Region. It will be composed, apart from the Regional Government of the Lodzkie Region, of local government entities of a lower level, academic and research institutions and business environment institutions. Their mission is to support the ultimate beneficiaries of the system - entrepreneurs, in particular small and medium-sized innovative companies. In pursuing their objectives, the innovators will also contribute to the fulfillment of the objectives set in the RIS LORIS 2030 of the Lodzkie Region, and thus to increase the level of innovation in the region.

Different levels of the innovation system, as well as selected groups of entities involved in the implementation of the RIS LORIS 2030, are shown in the following figure.

Figure 33. Levels and institutions involved in the development of the Regional Innovation System



Source: Own study.

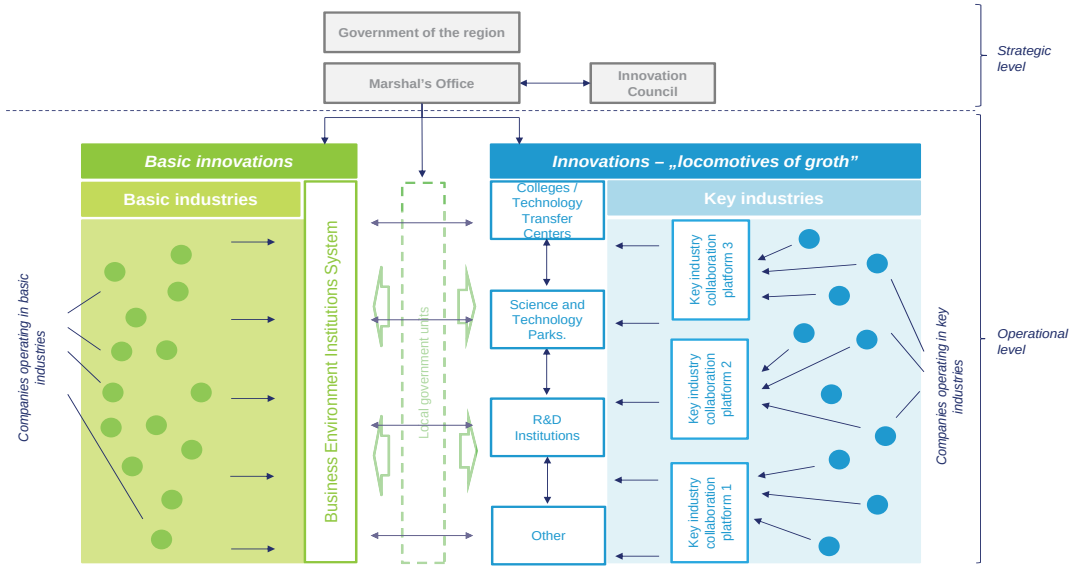
For the process of implementation of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030" to be successful, it will be necessary to find common ground for many participants of the system who do not cooperate with each other on a daily basis, and to establish cooperation between them to achieve a higher objective - the development of innovation in the region.

For the realisation of this task, particular structures of the system, both at the strategic level, i.e. the Marshal's Office of the Lodzkie Region, as well as at the operational level, must carry out activities provided for them, which have been broadly described in the next section of this document.

7.2 The System of implementation of the Regional Innovation Strategy in the lodzkie region

The proposed schedule of the implementation system of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030", covering the key participants of the system, as well as showing the relationships existing between them and the direction of information flow, is presented below.

Figure 34. Structure of the implementation of the Regional Innovation Strategy in the Lodzkie Region



Source: Own study.

The overall objective pursued by the process of designing a new system of implementation of the RIS LORIS 2030 was to identify the institutions / bodies responsible for carrying out their respective tasks, and thus organise a structure that will enable the effective management of innovation in the lodzkie region. In addition, to maximise the benefits from the implementation of RIS LORIS 2030 and to minimise the costs incurred as a result of this process, in the course of the design of the implementation system, emphasis was placed on seeking ways to exploit the potential of the already existing institutions and entities without having to create new, expensive and often inefficient bodies. To achieve the objectives, best practices in the design of the implementation systems, both other voivodeships and other EU countries were used as examples.

The proposed implementation system of the RIS LORIS 2030 in the Lodzkie Region consists of the Regional Government and the competent bodies of the Marshal's Office of the Lodzkie Region. In addition, the structure also includes other participants at the operational level. The remit, and the tasks for which the implementation will be required, were assigned to external organisations. In addition, the diagram shown on the previous page also contains the links that exist between the various participants. For an implementation system of the Regional Innovation Strategy outlined in such a way, an action plan for the functioning time of the document, along with a timetable for its implementation, was also prepared.

The system presented on the previous page includes solutions to optimise the pro-innovation activities carried out in the lodzkie region, taking into account the effective use of organisational, institutional and financial resources.

As a part of the strategic level there will be a „command centre" of the system, placed within the structures of the Marshal's Office of the Lodzkie Region. The Marshal's Office will be primarily responsible for organising the work of the bodies of strategic importance for the development of innovation in the lodzkie region, including the Innovation Council, as well as for initiating, coordinating, financing, monitoring and evaluating the activities of the participants of the operational level.

At the strategic level, the entity directly responsible for the implementation of the Regional Innovation Strategy should be the organisational entity of the Marshal's Office of the Lodzkie Region (Department

for Entrepreneurship) supported by the Innovation Council - acting as an advisory, consulting and controlling body.

In the implementation of RIS LORIS 2030, the selected organisational entity of the Marshal's Office of the Lodzkie Region (Department for Entrepreneurship), should serve as superior coordinator to all the bodies of the Marshal's Office that may affect the effectiveness of the Strategy's implementation.

However, given the extended horizon of the RIS LORIS 2030, up until 2030, one should not rule out that in the long term, with the intensification of the activities associated with the development of innovation in the lodzkie region, a separate entity exclusively dedicated to issues concerning the implementation of RIS LORIS 2030 will be created. The advantage of the creation of such an entity will be the fact that the resources that it will have will be fully devoted to the issues regarding innovative activities in the region. This in turn can have a positive impact on the coordination of works within the implementation system, and thus on the further development of the innovation potential of the lodzkie region.

The operational level of the implementation of the RIS LORIS 2030 was designed based on two key areas of coordinating the measures; they are:

- The area of innovations within the regional specialisation (driving forces of growth);
- The area of basic innovations.

This division was established in order to strengthen the synergies resulting from the operation of the groups of entities belonging to the voivodeship's development driving forces (companies, R&D centres, business environment institutions), as well as for better addressing the needs of all entrepreneurs, and to create the conditions for stimulating innovation among the companies from the lodzkie region.

The mechanisms to support implementation of the strategy, technology transfer and diffusion of innovation are provided within each area. In the case of innovation in the area of regional specialisation (driving forces of growth) we are dealing with companies belonging to the key industries of the lodzkie region, identified during the project works.

Cooperation Platforms of the key industry, based on industry coordinators, will operate within this area at the operational level. Here, an increasingly important role will be played by academic centres, research institutes, technology transfer centres, or science and technology parks.

In the case of the area of **basic innovations**, we are talking about entities that belong to the industries operating in the lodzkie region with the exception of regional specialisations. Within this area, at the operational level, it is assumed that there will be created a so-called System of 22 business environment institutions at the local level.

In addition to a model structure shown in Figure 19, the creation of task forces for specific projects is also not precluded. Such a group would be composed of representatives of the parties involved in the implementation of a given project.

The ultimate beneficiaries of the designed system of implementation will be the innovative companies belonging to both industries - regional specialisations, as well as to others that help to achieve the objectives set out in the Strategy, as well being a basis for economic development in the region.

The following describes the roles and tasks of the various participants in the system:

The Regional Government – the parent entity to the other participants in the system, which is the highest decision-making body.

The key tasks of the Regional Government will include, among others:

- Approval of Framework Action Plans;
- Management control at the strategic level;
- The ability of establishing a separate body, solely responsible for implementing the provisions of the RIS LORIS 2030 in the future.

The Marshal's Office of the Lodzkie Region (Department for Entrepreneurship) – it is assumed that at the time of initiating the implementation of the RIS, the body that exercises indirect and direct control over the implementation of the Strategy will be the Department for Entrepreneurship. In the implementation of the document, it will be a body superior coordinating in relation to the other departments and entities affecting the implementation of the RIS LORIS 2030, and it will also be in charge of the entire organisational structure of the system of implementation. The Department will act as the liaison between the institutions belonging to the strategic and operational level.

The key tasks of the Department for Entrepreneurship will include, among others:

- Creating an optimal environment for the implementation of innovative activities;
- Providing support of the local Government and other regulatory bodies in the region for the undertaken initiatives;
- Development of three-year Framework Action Plans;
- Planning and coordination of the Marshal's Office's of the Lodzkie Region own projects, such as system projects carried out by the Marshal's Office or in cooperation with other entities (such as academic centres, R&D entities, or business environment institutions);
- Monitoring and coordination of pro-innovation projects undertaken by other institutions outside the system;
- Organisation of works related to monitoring and evaluating the implementation of RIS;[64]
- Chairing the meetings of the Innovation Council.

Innovation Council – the body that acts as an opinion former, exercising control (monitoring) and consultancy primarily for the Department of Enterprise, but also for the Government of the Lodzkie Region. It is expected that the body will be created from the conversion of the Steering Committee supervising the process of preparing the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030". The composition of the Council should include representatives of all the communities involved in the construction of the Regional Innovation System. Therefore, in the event that either party does not have enough representation in the Council, an expansion of its membership is assumed. The Council should meet three / four times a year (e.g. quarterly), or more often if the rank of the decisions to be made will require consultation with a given entity. The key tasks of the Innovation Council will include, among others:

- Consultancy and issuing opinions on initiatives within the Framework Action Plans;
- Annual assessment of the implementation of the RIS LORIS 2030 (based on reports prepared by the Department of Enterprise).

The cooperation platform for the key industry based on the coordinators – to ensure the development of regional specialisations, the information about the objectives and directions of innovation policy must be distributed first. The innovation policy will be conducted in the region, and conditions for the integration of entities operating in the area of innovation in the region should be created. It is assumed that one of the key measures to be taken in the area of regional specialisation will be implementation

64 The monitoring and evaluation of the strategy is discussed in detail in the partial report Regional Monitoring and Evaluation System of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030".

within the currently designed innovation portal (Lodz Knowledge Transfer Platform) for the collaboration Platforms of key industries identified in the region. This tool will be an important element in the implementation system of the RIS LORIS 2030 in the area of innovation within the regional specialisation.

The portal is intended to provide full transparency and to enable communication and transfer of technology between entrepreneurs belonging to key industries and R&D institutions, technology transfer centres, science and technology parks or academic centres (including the appropriate department of each industry). A system designed in such a way will support the process of undertaking joint initiatives in the region.

The portal will contain the following information:

- A complete list of the enterprises belonging to a given key industry;
- A list of R&D institutions, technical schools, academic centres (i.e. appropriate for a given branch) along with the details of contact persons;
- Data concerning the business environment institutions, such as technology transfer centres, business incubators, or financial support institutions, such as guarantee funds, etc.;
- A calendar of meetings, conferences, industry initiatives in the region, the country and abroad;
- Other.

In order to build and update the information contained on the portal, performing the following measures (recommended in the form of system projects) will be necessary:

- Establishing and supporting a network of coordinators for regional specialisations;
- Identification of actors within each of the key industries in the region, such as enterprises, R&D institutions, academic centres, technical schools, etc.

A platform prepared in such a way will support the creation of a cooperation network, technology transfer from science to business, and it will also be a comprehensive knowledge base for entrepreneurs, regarding the entities supporting the development of a given industry in the region, thus making it possible to contact the right entity directly.

The main tasks of key industry cooperation Platforms and their coordinators will include, among others:

- Accumulation and building knowledge in areas of specialisation, including the acquisition of knowledge about the offer of the R&D entities operating in the region in the scope of the chosen specialisations;
- Support in establishing cooperation between enterprises and the R&D sector;
- The search for potential business partners from abroad for companies operating in the areas of specialisation, organisation of direct bilateral meetings for entrepreneurs, assistance in the organisation of business missions and / or participation in international fairs;
- Gathering information on "*best practices*" within the scope of technologies transfer in areas of particular regional specialisations;
- Supplementing the *Platforms'* resources on current activities and initiatives in selected areas of specialisation;
- Referring to the appropriate departments providing specialist support in selected areas of specialisation.

In addition, the tool has one major advantage - it will use the existing mechanisms, such as the Lodz Knowledge Transfer Platform. This approach prevents the dispersion of information and its concentration in one place, making it easier to find for potential stakeholders.

It should be emphasised that it is projected that a parallel key industry cooperation Platform will be created, and a coordinator will be chosen for every identified key industry in the lodzkie region.

The business environment institutions system (the BEI System) – one of the most frequent complaints in relation to the opportunities for innovation in the region was the spread information about funding opportunities for innovation, as well as the lack of sufficient knowledge in this area by local government officials. Therefore, one of the key elements of the proposed implementation system of RIS LORIS 2030 in the Lodzkie Region will be the creation of a System of business environment institutions. It will consist of 22 entities stationed in the lodzkie region (one in each country district capital, with the exception of cities with county rights[65]). It is assumed that these institutions will be selected by means of the system project, during the first stage of the implementation of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030".

The system project also involves the choice of the controlling entity of the entire BEI System (which can also serve as one of the 22 BEI entities), and which will be responsible for preparing the interim report on the functioning of the System for the Department for Entrepreneurship. The proposed choice in this regard is the Lodz Regional Development Agency S.A. which, due to the range of offered services as well as the possessed resources, may play a significant role in the process of implementation the regional innovation policy in the lodzkie region.

Figure 35. Diagram of the business environment institutions network

Source: Own study.

Entities belonging to the System of Business Environment Institutions will be the already functioning institutions that support business activities, such as the local Chambers of Commerce, Regional Development Agencies, Regional Economy Chambers, the relevant departments of local government entities, business incubators, etc. There will be at least two workers assigned for the implementation of the tasks involved in the implementation system of the RIS within the county entity belonging to the BEI System. This allows for the preservation of continuity of service in the case of dismissals

65 The exception being the Lodz municipality, which is a city with county rights.

or holidays. It is assumed that the entity will act as the first point of contact, providing the interested parties with comprehensive information and directing them to the appropriate specialist entities, such as e.g. technology transfer centres, loan funds, etc.

The key tasks of the institutions belonging to the Business Environment Institutions System will include, among others:

- Supporting businesses and other stakeholder groups belonging to all industries operating in the region, including the provision of comprehensive information on:
  - possible sources of financing for entrepreneurship and innovation,
  - functioning of the various sources of financing for innovative activities,
  - business environment institutions, R&D entities and other entities operating in the region that can fully address the issues raised by clients;
- Providing training and advice to businesses within the individual counties in the area of preparation and execution capabilities of innovative projects;
- Gathering knowledge about the companies operating in various counties, with particular emphasis on the functional areas, preparing information about the offer of cooperation possible between the science and business sectors, including the replenishment of resources of the Lodz Knowledge Transfer Platform;
- Assisting in establishing cooperation with the entities involved in specialist support and advice, such as: CTTs, science and technology parks, business incubators, etc.;
- Activation of companies operating within the county, and when it comes to networking - indicating the benefits of innovation, possible sources and methods of financing for innovative projects;
- Creation of platforms for the exchange of experience at the level of functional areas.

In view of the information required for persons responsible for the operation of the county entity of the BEI System, an organisation of periodic training will be required, allowing the transfer of knowledge about changes in legislation and in the system of financing innovation by the Marshal's Office of the Lodzkie Region, or selected operators in the Regional Innovation System.

The Business Environment Institutions System designed in such a way will significantly influence the effectiveness of the implementation of RIS in the region by giving entrepreneurs from a given county the ability to obtain comprehensive support information in one place. Creating the BEI System, and thereby the entrepreneurs' awareness of the existence of authorities willing at any time to provide them with explanations or identification of the competent bodies in a given area and no need to search for scattered information, will stimulate the enterprises in the lodzkie region to undertake innovative activity.

External institutions involved in the implementation of RIS LORIS 2030 – the institutions involved in the implementation of the Strategy at the operational level, which will be responsible for implementing on their own or in cooperation with other actors of innovation activities, include: R&D institutions, academic centres, technical and vocational schools, business environment institutions (technology transfer centres, business incubators, institutions supporting cluster operations (e.g. cluster brokers, etc.), local government entities.

It should be noted that in order for the designed System to implement the Regional Innovation Strategy in the Lodzkie Region to work in accordance with the adopted plan and to contribute to raising the level of innovation of the region, it is necessary to properly promote it. The tools designed for its needs, such as the Key Industries Cooperation Platform or the Business Environment Institutions System, particularly

require increased marketing efforts to allow potential beneficiaries to ascertain the existence of such instruments, as well as the benefits they bring.

In according with the assumptions described in the section on funding models, the financing of the innovation management system in the lodzkie region will come primarily from public funds. For this purpose, various sources of funding will be used, including the Regional Operational Programme of the Lodzkie Region, national programmes co-financed by the national budget or EU funds from the European programmes (including from the European Social Fund), the measures of national programmes as well as own funds resources of local government entities.

However, in order to implement the provisions of the Strategy both public funds, as well as other sources of funding will be used, including those outside the subsidies. Appropriate emphases in the use of relevant sources or creating effective financing instruments, and thus addressing the needs of entrepreneurs in this field, will be one of the key challenges in the construction of the Regional Innovation System. This is why it is so important to support the functioning and creation in the region of such tools as: angel investors, loan funds, credit guarantee funds etc.

In conclusion, it is assumed that the system of implementation of the RIS LORIS 2030 in the lodzkie region has to enable:

- The use of the existing organisational, institutional and financial potential;
- Mobilisation of all the participants of the Regional Innovation System for its construction;
- Effective coordination and monitoring of measures at both the strategic and operational level;
- Integration of the environments operating in the same industries (networking, cooperation, e.g. consortia of companies and R&D entities, and / or clusters);
- Achieving synergies arising from the cooperation between different groups of stakeholders, at regional, national, and international levels;
- Implementation of comprehensive pro-innovation measures involving different groups of participants of the Regional Innovation System.

Chapter 8

System of monitoring, evaluating and updating the Regional Innovation Strategy for the Lodzkie Region - “LORIS 2030”

The concept of constructing a monitoring and evaluation system for the RIS LORIS 2030 and modelling of future trends

The subject of monitoring for RIS LORIS 2030

List of indicators proposed in the RIS LORIS 2030

Implementation schedule for RIS LORIS 2030 and the plan for the realisation of monitoring works

HUMAN CAPITAL
NATIONAL COHESION STRATEGY

Lodzkie Region

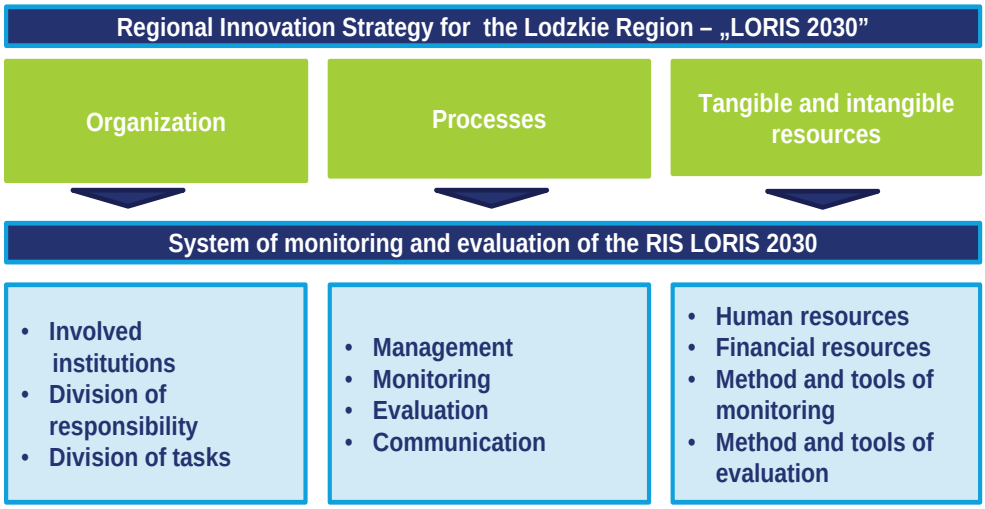
EUROPEAN UNION
EUROPEAN
SOCIAL FUND

8. System of monitoring, evaluating and updating the Regional Innovation Strategy for the Lodzkie Region - "LORIS 2030"

8.1 The concept of constructing a monitoring and evaluation system for the RIS LORIS 2030 and modelling of future trends

The lines of measure and strategic objectives adopted in the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030" directly determines the development of the implementation system of the RIS LORIS 2030 and the framework for the functioning of mechanisms of the shaping of the innovation policy in the lodzkie region. Also, the system of monitoring and evaluation of the RIS LORIS 2030 must be, in terms of organisation and process, developed on the basis of available resources, tangible and intangible.

Figure 36. The resources necessary to build a system of monitoring and evaluating the RIS LORIS 2030



Source: Own study.

Set out below are the necessary tangible and intangible resources necessary to create a system of monitoring and evaluating the RIS LORIS 2030.

ORGANISATION

The involved institutions

- ***Country level:***

Ministry of Regional Development, Ministry of Economy, Ministry of Science and Higher Education, Ministry of National Education, but also institutions like the Polish Agency for Enterprise Development.

- ***Regional level - strategic institutions of the region:***

The Regional Government of the Lodzkie Region, the Marshal's Office of the Lodzkie Region in Lodz and the advisory body especially appointed for the implementation of RIS LORIS 2030 - the Innovation Council. Academic and scientific centres as well as local governments of lower levels (county, municipal).

- ***Regional level - the institutions responsible for the implementation in the region***

22 Business Environment Institutions, a Network of coordinators for regional specialisations, a Network of Technology Transfer Centres, set up to implement the RIS LORIS 2030.

Division of responsibility

- ***Country level***

Preparation of financial / operational programmes designed to create and support the development of innovation.

- ***Regional level - strategic institutions of the region***

Preparation of financial instruments / operational programme intended to create and support development of innovation at the level of the lodzkie region. Coordination and organisation of work for the implementation of RIS LORIS 2030, through the organisation of work within the framework of the Steering Committee for the Implementation of the Strategy and implementation of Framework Action Plans.

- ***Regional level - the institutions responsible for the implementation in the region***

The implementation of the various measures planned for implementation within the RIS LORIS 2030.

Division of tasks

- ***Country level:***

Preparation of methodological documents defining the rules of the process of monitoring and evaluating financial instruments / operational programmes at the national level.

- ***Regional level - strategic institutions of the region:***

Establishment of a cell which task will be to conduct the process of monitoring and evaluating the activities carried out by the participants of the operational level of implementation of the RIS LORIS 2030 located in the „command centre" of the system, within the structures of the Marshal's Office in Lodz of the Lodzkie Region.

Preparation of methodological documents defining the rules of the process of monitoring and evaluating the RIS LORIS 2030.

Coordination of the monitoring and evaluation works for the entities responsible for the implementation of RIS LORIS 2030.

Preparation of Annual Action Plans with quantification of the target values of growth rate indicators implemented within the RIS LORIS 2030.

The development of synthetic reports based on data stored in the system and the preparation of analyses.

Development of evaluation reports summarising the performance of measures.

- ***Regional level - the institutions responsible for implementation in the region***

Conducting the monitoring process (from the project level), regarding the scope of the powers conferred upon the organization.

Preparation of Annual Action Plans with quantification of the target values of growth rate indicators implemented within the powers conferred upon the organisation within the RIS LORIS 2030.

PROCESSES

Monitoring

- ***Monitoring physical progress***

Monitoring actual progress is delivered by data showing the progress in implementing the strategy / programme / project and allows the evaluation of its performance in relation to the designated objectives in the form of quantified target values.

Monitoring physical progress should be based on two categories of indicators:

- product indicators that relate to the effects of the performance. These are the effects achieved as a result of direct spending, measured in material units.
- result indicators corresponding to the direct and immediate effects resulting from the implementation of the strategy / programme / project. They can take the form of material or financial indicators.

- ***Monitoring financial progress***

Financial monitoring provides data on the financial aspects of the implementation of the Strategy / operational programmes / projects and provides a basis for assessing the efficiency of spending allocated to it.

Evaluation

- Functions of evaluation: building partnerships and joint ownership, improvement of the implementation and improvement of the quality, rationalisation of planning, cognitive function, and strengthening and clearing of responsibility.

Management

- The monitoring process consists in systematic collection, reporting and interpretation of data which describes the progress and results of implementing the strategy. Therefore, it provides a very broad range of knowledge and information necessary in order to perform effective management, at the same time fulfilling, among others, the role of a system of early warning about possible irregularities, necessity to introduce changes or even a policy in a given area, spending accuracy, implementation of the intended goals etc. It can thus be said to effectively support the process of management of RIS LORIS 2030 implementation measures.

Communication

- As a result of conducting monitoring works, the institutions responsible for the implementation of RIS LORIS 2030 will have tremendous knowledge resources within the scope of correctness of document implementation. Therefore, they should, in a planned and systematic manner, make such information available by ensuring an informative and promotional service at the Voivodeship, national and European levels;
- Informative and promotional action plans should be prepared in advance and then systematically implemented.

TANGIBLE AND INTANGIBLE RESOURCES

Human resources

- The organisational entity team responsible for conducting monitoring and evaluation processes, operating within the framework of the Marshal's Office of the Lodzkie Region.
- Persons involved in monitoring, working in establishments intended to implement the RIS LORIS 2030, the 22 Business Environment Institutions, network of coordinators for regional specialisations, Network of Technology Transfer Centres.

Financial resources

European Union funds, funds from the state budget, JST funds, private funds

Methods and tools of monitoring

The reporting system

Reporting is a key tool in the monitoring process, carried out at all institutional levels of the implementation of the RIS LORIS 2030 based on methodological documents, setting the rules of the process, and procedures for reporting, time and standard forms (preferably in electronic form).

Reporting at the project level equals collecting information on: the course of the various stages of the project in the form of figures and financial data, the indicators achieved, problems related to the implementation of the project, the tasks planned for the next reporting period.

Methods and tools of evaluation

- ***Methods: quantitative and qualitative research, including quantitative research techniques:*** PAPI, CAPI, CASI, CAPI, CATI, CAWI, and qualitative research techniques: Focus Group Interviews (FGI), Individual In-depth Interviews (IDI).

8.2 The subject of monitoring for RIS LORIS 2030

The subject of monitoring is all of ongoing works / projects carried out in the lodzkie region in the area of stimulating entrepreneurship, innovation and works in research and development.

The multiplicity of sources of funding for this type of activity makes it necessary to impose reporting obligations on the institutions mentioned in the document (at least 22 Business Environment Institutions and appointed coordinators for both regional specialisation, as well as general business), it would be much better if the participants were also the entrepreneurs benefiting from the support and research institutions.

The best solution would be the separation of a module of the Lodz Knowledge Transfer Platform that would allow the registration of projects pursuing the objectives of RIS LORIS 2030. The proposed scope of the project is:

PROJECT LEVEL – data in the following scope:

- Name of the project;
- Localisation of the project;
- Source of funding for the project (the name of the operational programme / long-term programme);
- The value of the project, broken down by financial sources (e.g. EU funds, state budget, JST budget, the contribution of private entrepreneurs);
- The partners implementing the project;
- Project execution plan / schedule.

PROGRAMME LEVEL (IT tool functionality from the programme level). Valuable would be the ability to:

- Create summary reports showing within which programmes the RIS LORIS 2030 is implemented;
- Create reports on the timeliness of the investments;
- Create physical progress reports, i.e. the operational indicators, etc.

The scope of monitoring;

Acquisition of the raw data should be conducted at the level of the projects. Then, the data should be aggregated, analysed and presented as reports and statements, as well as, in appropriate cases, additionally assessed in the evaluation process.

Method of conducting monitoring and evaluation works.

Monitoring work must be carried out in accordance with the planned path of the proceedings. It would be advisable for the Marshal's Office of the Lodzkie Region to prepare documents constituting methodological support for the institutions involved in the process of monitoring.

8.3 List of indicators proposed in the RIS LORIS 2030

A measure of the main objective

A synthetic measure of innovation development of the lodzkie region is its position in the ranking **Regional Innovation Scoreboard (RIS),** recommended by the European Commission.

According to a report published in 2012, the lodzkie region is classified in the ranking as „Poor innovator – medium level". Thus, a major challenge for the year 2030 would be landing two levels above, at: „Moderate innovator – medium level".

Table 33. A measure of the main objective of RIS LORIS 2030

The Lodzkie Region	Leader of innovativeness			Catching up innovator			Moderate innovator			Poor innovator		
Scale	low	medium	high	low	medium	high	low	medium	high	low	medium	high
2012											X	
2030								X				

Source: Own study based on the Regional Innovation Scoreboard 2012.

Context indicators

Context indicators showing the level of development of the region in terms of innovation, research and development and academics.

Table 34. Context indicators for monitoring RIS LORIS 2030

	No. of the indicator	Name of the indicator	Base value (2010)	Base value (2011)	Source of the data
Research & development activities	**1**	**Total number of research and development entities**	**111 pcs**	**No data**	**GUS, BDL**
	1.1	w tym w sektorze przedsiębiorstw	82 szt.	No data	GUS, BDL
	2	**Expenditure on R&D in total, including:**	**553,2 million PLN**	**578,5 million PLN**	**GUS, BDL**
	2.1	in the enterprise sector	92,4 million PLN	102,3 million PLN	GUS, BDL
	2.2	in the government sector	163,8 million PLN	0,0 million PLN	GUS, BDL
	2.3	in the tertiary education sector	296,0 million PLN	324,6 million PLN	GUS, BDL
	2.4	expenditure on R&D per capita	217,9 PLN	228,0 PLN	GUS, BDL
	2.5	expenditure on R&D per 1 employed in R&D	72,8 thousand PLN	73,6 thousand PLN	GUS, BDL
	2.6	relation to GDP (current prices)	0,64 %	0,00 %	GUS, BDL
	2.7	participation of businesses incurring expenditure on R&D in the total number of entities	19,7 %	17,3%	GUS, BDL
	3	**Expenditure on R&D by fields of science in total, including:**	**553155,6 thousand PLN**	**578457,4 thousand PLN**	**GUS, BDL**
	3.1	expenditures in natural sciences	144178,7 thousand PLN	128327,2 thousand PLN	GUS, BDL
	3.2	expenditures in the field of engineering and technical sciences	175540,1 thousand PLN	185795,0 thousand PLN	GUS, BDL
	3.3	expenditures in the field of medicine and health sciences	79481,5 thousand PLN	0,0 thousand PLN	GUS, BDL

	No. of the indicator	Name of the indicator	Base value (2010)	Base value (2011)	Source of the data
Research & development activities	**4**	**Expenditure in the business sector on &D by total courses of action, including:**	**92,4 million PLN**	**102,3 million PLN**	**GUS, BDL**
	4.1	expenditures in the business sector on R&D activity in agriculture, animal husbandry, hunting and service activity	0,0 thousand PLN	0,0 thousand PLN	GUS, BDL
	4.2	expenditures in the business sector on R&D in food production	0,0 thousand PLN	572,8 thousand PLN	GUS, BDL
	4.3	expenditures in the business sector on R&D in the production of textile products	1264,8 thousand PLN	622,2 thousand PLN	GUS, BDL
	4.4	expenditures in the business sector on R&D in the production of clothing	0,0 thousand PLN	0,0 thousand PLN	GUS, BDL
	4.5	expenditures in the business sector on R&D in the production of basic pharmaceutical products and medicines and other pharmaceutical products	33110,8 thousand PLN	9874,1 thousand PLN	GUS, BDL
	4.6	expenditures in the business sector on R&D in the production of rubber and plastic products	741,4 thousand PLN	1144,2 thousand PLN	GUS, BDL
	4.7	expenditures in the business sector on R&D in the production of products from other mineral, non-metallic raw materials	0,0 thousand PLN	0,0 thousand PLN	GUS, BDL
	5	**Employed in R&D in total (according to EPC), including:**	**4490,8**	**4711,6**	**GUS, BDL**
	5.1	in the business	631,8	765,3	GUS, BDL
	5.2	in the government sector	920	0,0	GUS, BDL
	5.3	in the tertiary education sector	2924	2790,5	GUS, BDL
Ction of industrial	13.	Submitted patents	212 pcs	282 pcs	GUS, BDL
	14.	Granted patents	94 pcs	137 pcs	GUS, BDL
	15.	Submitted utility patterns	56 pcs	56 pcs	GUS, BDL
	16.	Granted protective rights	23 pcs	16 pcs	GUS, BDL
Tertiary education	22.	Tertiary education graduates per 10 thousand people	131	120	GUS, BDL
	23.	University students aged 19-24	452	427	GUS, BDL
	24.	Students of doctoral studies	2754	2960	GUS, BDL

Source: Own study.

Measures of strategic objectives

The objective of Priority 1. Regional specialisation

The strategic objective under this priority is to build competitive advantages - driving forces of economic development characteristic of the lodzkie region (key industries).

The actions taken, as a result, should among others, increase the participation of key industries in the sold production of companies, the number of national economic entities in these industries should increase, and employment and investment in research and development should increase. Certainly, many other indicators should also be a measure of success associated with the animation of key sectors, but unfortunately, restrictions on the availability of data make it that only the above can be measured.

Selecting different regional specialisations, the lodzkie region should strive to achieve the leading position in the ranking of regions in selected areas, so that the production growth rate, expenditures on R&D and an increase in the number of entities in the areas of specialization should always be higher than the average parameters for Poland (variant minimum). It would also be desirable to be the highest in the country (variant maximum). Based on the scenarios for development and taking into consideration that in moderate (neutral) scenario 22-28% of enterprises operating in the key industries will be considered innovative, and that projected spending on R&D in relation to GDP will be three times greater, the below target values were proposed.

Table 35. Strategic indicators for monitoring the objective of *Priority 1. Regional specialisation RIS LORIS 2030*

No.	Name ot the indicator	Base value (2010)	Base value (2011)	Target value (2030)	Source of the data
Advanced building materials					
1.1	Dynamics of industrial output in section 22 (acc. to PKD) Manufacture of rubber and plastic products (previous year = 100)	109,3 %	No data	The first position in Polish voivodeships ranking*	GUS, BDL
1.2	Number of national economy entities entered to the REGON register in section 22 (acc. to PKD) Manufacture of rubber and plastic products	1159 szt.	1145 pcs	Increase of at least 25% - 1374 pcs	GUS, BDL
1.3	Expenditures in the business sector for R&D acc. to activity directions in section 22 (acc. to PKD) Manufacture of rubber and plastic products	741,4 thousand PLN	1144,2 thousand PLN	3433 thousand PLN	GUS, BDL
1.4	Dynamics of industrial output in section 23 (acc. to PKD) Manufacture of products from other mineral non-metallic raw materials (previous year = 100)	139,3%	No data	The first position in Polish voivodeships ranking	GUS, BDL
1.5	Number of national economy entities entered to the REGON register in section 23 (acc. to PKD) Manufacture of products from other mineral non-metallic raw materials	1442 pcs	1390 pcs	Increase of at least 25% - 1668 pcs	GUS, BDL
1.6	Expenditures in the business sector for R&D acc. to directions of activity in section 23 (acc. to PKD) Manufacture of products from other mineral non-metallic raw materials	0 thousand PLN	0 thousand PLN	27 693 thousand PLN	GUS, BDL
Energy production					
1.7	Dynamics of industrial output in section D (acc. to PKD). Production and supply of electricity, gas, steam, hot water and air to air conditioning systems (previous year = 100)	0,0	No data	The first position in Polish voivodeships ranking	GUS, BDL
1.8	Number of national economy entities entered to the REGON register in section D (acc. to PKD). Production and supply of electricity, gas, steam, hot water and air to air conditioning systems	249pcs	279 pcs	Increase of at least 25% - 335 pcs	GUS, BDL
1.9	Expenditures in the business sector for R&D acc. to directions of activity in section D (acc. to PKD) Production and supply of electricity, gas, steam, hot water and air to air conditioning systems	0 thousand PLN	0 thousand PLN	1800 thousand PLN	GUS, BDL

* Index numbers are calculated always in relation to the previous year, so it is not mathematically correct estimation of the target value in%, while it is not an error indicating the position of the other provinces.

No.	Name ot the indicator	Base value (2010)	Base value (2011)	Target value (2030)	Source of the data
Agriculture, agricultural and food processing					
1.10	Dynamics of industrial output in section 01 (acc. to PKD). Crops, animal husbandry, including service activity (previous year = 100)	No data	No data	The first position in Polish voivodeships ranking	GUS, BDL
1.11	Number of national economy entities entered to the REGON register in section 01 (acc. to PKD). Crops, animal husbandry, including service activity	4213 pcs	4312 pcs	Increase of at least 25% -5175 pcs	GUS, BDL
1.12	Expenditures in the business sector on R&D acc. to directions of activity: in section 01 (acc. to PKD). Crops, animal husbandry, including service activity	0 thousand PLN	0 thousand PLN	61 294 thousand PLN	GUS, BDL
1.13	Dynamics of industrial output in section 10 (acc. to PKD). Food production (previous year = 100)	96,9%	No data	The first position in Polish voivodeships ranking	GUS, BDL
1.14	Number of national economy entities entered to the REGON register in section 10 (acc. to PKD) Food production	2545 pcs	2518 pcs	Increase of at least 25% -3022 pcs	GUS, BDL
1.15	Expenditures in the business sector on R&D acc. to directions of activity in section 10 (acc. to PKD) Food production	0,0 thousand PLN	572,8 thousand PLN	1718 thousand PLN	GUS, BDL
Medicine, pharmacy, cosmetics					
1.16	Dynamics of industrial output in section 21 (acc. to PKD) Production of primary pharmaceutical substances as well as medicines and other pharmaceutical products (previous year = 100)	107,4 %	No data	The first position in Polish voivodeships ranking	GUS, BDL
1.17	Number of national economy entities entered to the REGON register in section 21 (acc. to PKD) Production of primary pharmaceutical substances as well as medicines and other pharmaceutical products	50 pcs	50 pcs	Increase of at least 25% 60 pcs	GUS, BDL
1.18	Expenditures in the business sector on R&D acc. to directions of activity in section 21 (acc. to PKD) Production of primary pharmaceutical substances as well as medicines and other pharmaceutical products	33110,8 thousand PLN	9874,1 thousand PLN	29622 thousand PLN	GUS, BDL
Modern textiles and fashion industry					
1.19	Dynamics of industrial output in section 13 (acc. to PKD). Manufacture of textiles (previous year = 100)	96,6 %	No data	The first position in Polish voivodeships ranking	GUS, BDL
1.20	Number of national economy entities entered to the REGON register in section 13 (acc. to PKD) Manufacture of textiles	1804 pcs	1795 pcs	Increase of at least 25% - 2154 pcs	GUS, BDL
1.21	Expenditures in the business sector on R&D acc. to directions of activity 13 (acc. to PKD). Manufacture of textiles	1264,8 thousand PLN	622,2 thousand PLN	1867 thousand PLN	GUS, BDL

No.	Name ot the indicator	Base value (2010)	Base value (2011)	Target value (2030)	Source of the data
1.22	Dynamics of industrial output in sectin 14 (acc. to PKD). Manufacture of clothing (previous year = 100)	105,2 %	No data	The first position in Polish voivodeships ranking	GUS, BDL
1.23	Number of national economy entities entered to the REGON register in section 14 (acc. to PKD) Manufacture of clothing	8303 pcs	7666 pcs	Increase of at least 25% - 9200 pcs	GUS, BDL
1.24	Expenditures in the business sector on R&D acc. to directions of activity in section 14 (acc. to PKD) Manufacture of clothing	0 thousand PLN	0 thousand PLN	3792 thousand PLN	GUS, BDL

Source: Own study.

The objective of Priority 2. Development of the region's innovative potential

The strategic objective under this priority is the use of internal potentials of the region to improve the innovation of economy in the lodzkie region.

As a result of the actions taken, expenditure on innovation activities in businesses should increase, so as to increase their competitive advantage that will improve the economic condition of businesses, and consequently, this should result in an increase in employment.

Despite the fact that many other indicators should also be a measure of the innovative development of the region, restrictions on the availability of data make it that only the following can be measured.

Table 36. Strategic indicators for monitoring the objective of *Priority 2. Development of the region's innovative potential RIS LORIS 2030*

No.	Name of the indicator	Base value (2010)	Base value(2011)	Target value (2030)	Source of the data
2.1	**Expenditure on innovation activities in businesses in total, including:**	**51267 thousand PLN**	**2 366 425 thousand PLN**	**7 099 275 thousand PLN**	**GUS, BDL**
2.1.1	Service enterprises	51267 thousand PLN	65 892 thousand PLN	197 676 thousand PLN	GUS, BDL
2.1.2	Industrial enterprises	0 thousand PLN	2 300 533 thousand PLN	6 901 599 thousand PLN	GUS, BDL
2.2	**Expenditures on innovation in industrial businesses in total Innovative service enterprises by types of total introduced innovations, including:**	**10,34%**	**8,46%**	**28%**	**GUS, BDL**
2.2.1	Innovative service enterprises which introduced new or significantly improved products	6,05%	4,09%	23%	GUS, BDL
2.2.2	Innovative service enterprises which introduced new products or ones significantly improved to the market	2,70%	1,34%	22%	GUS, BDL
2.2.3	Innovative service enterprises which introduced new or significantly improved processes	8,59%	7,12%	22%	GUS, BDL

No.	Name of the indicator	Base value (2010)	Base value(2011)	Target value (2030)	Source of the data
2.3	**Innovative industrial businesses by type of introduced innovations in total including:**	**13,42%**	**11,08%**	**35%**	**GUS, BDL**
2.3.1	Innovative industrial businesses that introduced new or significantly improved products	10,13%	7,62%	30%	GUS, BDL
2.3.2	Innovative industrial businesses that introduced new or significantly improved products to the market	5,25%	4,60%	35%	GUS, BDL
2.3.3	Innovative industrial businesses that introduced new or significantly improved processes	9,75%	8,59%	35%	GUS, BDL
2.4	**The share of sold production of new / significantly upgraded products in industrial enterprises in the value of total product sales**	**6,6%**	**6,06%**	**28%**	**GUS, BDL**

Source: Own study.

The objective of Priority 3. Managing the region's innovations

The strategic objective under this priority is to improve the management of innovation in the region. We assume that the measure of success of Objective 1 and Objective 2 will be the positive changes in the socio-economic situation resulting from improved innovation in the voivodeship, which is why we use contextual indicators to describe the objectives.

Objective 3 of RIS LORIS has a completely different character, it is an objective directed towards operational activities, therefore, a measure of the success of this objective will be the operational indicators set out in the table below.

Table 37. Strategic indicators for monitoring the objective of *Priority 3. Managing the region's innovations RIS LORIS 2030*

No.	Name of the indicator	Base value (2011)	Target value (2030)	Source of the data
3.1	Product. The number of operating business environment institutions providing advisory services for SMEs within the network	0	min. 22	RIS LORIS 2030 Monitoring system
3.2	Product. The number of coordinators providing services for entrepreneurs within the regional specialisation	0	min. 5	RIS LORIS 2030 Monitoring system
3.3	Product. The number of technology transfer centres providing services within the network	0	min. 5	RIS LORIS 2030 Monitoring system
3.4	Result. The number of businesses that have been provided with support within the RIS LORIS 2030	0	Come of action plans after determining the allocation of the ROP	RIS LORIS 2030 Monitoring system Aggregated from objective 1,2,3

Source: Own study.

Measures of the objectives of the actions

Key industry – an industry that has been indicated within the RIS as an industry implementing regional specialisation.

In the following table, the „P" stands for the product indicator, the „R" stands for the indicator of the physical progress result of the objectives mentioned for implementation within the individual actions, while „F" stands for the indicator of the financial progress of the implementation of RIS LORIS 2030.

Table 38. Operational indicators for monitoring the RIS LORIS 2030

Operational objective	Measure	Name of the indicator	Measurement unit	Base value (2011)	Target value (2030)
Priority 1. Regional specialisation					
1.1. Building awareness of regional specialisation	1.1.1. Integration in the area of key industries	P. The number of initiatives aimed at improving the awareness of entities operating in the areas of key industries	Pieces	0	340
		R. The number of cooperation networks created within regional specialisation	Pieces	0	5
	1.1.2. Experience exchange programmes at the national and international level	P. The number of experience exchange projects implemented in the area of key industries	Pieces	0	85
		R. The number of completed research projects within the established partnerships in the area of key industries	Pieces	0	170
	1.1.3. Promotion of key industries / specialisations	P. The number of organised events aimed at promoting key industries and regional specialisations.	Pieces	0	680
		P. The number of events in which key industries and regional specialisations have been promoted	Pieces	0	1360
1.2. Construction of the intellectual potential of regional specialisation	1.2.1. Creation of training programmes for regional specialisation	P. The number of proprietary curricula of vocational education in educational institutions to meet the needs of key industries	Pieces	0	170
		R. The number of persons included in the proprietary curricula of vocational education in educational institutions to meet the needs of key industries	People	0	25 thousand
	1.2.2. Staff exchange programmes between science and business	P. The number of implemented proprietary curricula of vocational and technical education in educational institutions to meet the needs of key industries	Pieces	0	85
		R. The number of scientists who completed internships and work experience within the staff exchange programme between science and business	People	0	5 thousand
	1.2.3. Development of vocational and technical education to meet the needs of regional specialisation	P. The number of prepared training and consulting projects in the field of regional specialisation	Pieces	0	170
		R. The number of students undergoing training within the proprietary curricula of vocational education to meet the needs of key industries	People	0	10 thousand

	1.2.4. Support for the businesses' needs for training and advice for the purpose of regional specialisation	P. The number of prepared training and consulting projects in the field of regional specialisation	Pieces	0	340
		R. The number of supported enterprises operating in key industries regarding the range of the training and consulting services provided to them	Pieces	0	18
1.3. Improving communication in the area of regional specialisation	1.3.1. Preparation of the offers for cooperation between science and business	P. The number of offers prepared by scientific entities for key sectors	Pieces	0	680
		R. The number of entities that have benefited from the offers of scientific entities for key sectors	Pieces	0	12 thousand
	1.3.2. Supporting efforts of mutual communication within the specialisation	P. The number of annual communication plans made within the specialisation	Pieces	0	85
		R. Number of activities carried out within the annual communication plans made within the specialisation	Pieces	0	1020
	1.3.3. Dedicated training and brokerage meetings within the specialisation	P. The number of training and brokerage meetings organised within the specialisation	Pieces	0	340
		R. The number of enterprises supported in the counselling and legal area operating in key sectors	Pieces	0	23 thousand
1.4. Support for cooperation projects within clusters and areas of specialisation	1.4.1. Establishing clear rules for cooperation	R. The number of universities that have joined the consortium / network of Technology Transfer Centres and implemented the model procedures regarding the cooperation between science entities and businesses	Pieces	0	9
	1.4.2. Realising research and development projects within regional specialisation	P. The number of completed joint research and development projects within regional specialisation	Pieces	0	100
	1.4.3. Support for the process of technology transfer from science to business	P. The number of projects aimed at improving the offer of specialised services regarding technology transfer in the areas of regional specialisation	Pieces	0	3000
		R. The number of providers of specialised services regarding technology transfer	Pieces	0	22
	1.4.4. Cooperation including iInter-regional and international cooperation	P. The number of implemented exchange of experience projects in the area of key sectors at the interregional and international level	Pieces	0	85
1.5. Providing a financing system of projects aimed at regional specialisation	1.5.1. Financial support for projects within regional specialisation	F. The funds for implementing projects under Priority 1 Regional specialisation, including: - EU funds - the state budget funds - private funds - the Regional Government funds	Thousands of PLN	0	To be updated after the adoption of ROP 2014-2020 and country projections

Priority 2. Development of innovative potential					
2.1. Raising awareness of the benefits of innovation	2.1.1. Shaping the attitudes of pro-innovative entrepreneurs, especially in the SME sector	P. The number of implemented projects regarding building pro-innovation attitudes, especially among SMEs	Pieces	0	340
	2.1.2. Promotion of regional innovation	P. The number of initiatives aimed at improving the awareness of enterprises in the area of innovation	Pieces	0	170
2.2. Promotion of knowledge about innovation and trepreneurship	2.2.1. Curricula that promote innovation and entrepreneurship at all levels of education	P. Number of implemented projects aimed at promoting innovation and entrepreneurship among young people and students	Pieces	0	680
		R. The number of people who have benefited from projects aimed at promoting innovation and entrepreneurship	People	0	23 thousand
	2.2.2. Promotion of eco-innovation	P. The number of initiatives aimed at improving the awareness of enterprises in the area of eco-innovation	Pieces	0	23 thousand
		R. The number of companies that have participated in initiatives aimed at promoting eco-innovation	Pieces	0	30 thousand
	2.2.3. Consulting and training activities to promote innovation	R. The number of companies that have been provided with comprehensive advisory services	Pieces	0	32 thousand
	2.2.4. Staff exchange programmes between universities and business to promote innovation	P. The number of organised staff exchange programmes between science and business	Pieces	0	85
		R. The number of scientists who completed internships and work experience under the staff exchange programme between science and business	People	0	5 thousand
2.3. Platforms for the exchange of experiences and ommunication	2.3.1. Supporting mechanisms of exchange of information and communication	P. The number of operating specialised platforms for the exchange of information and communication	Pieces	0	min. 5
	2.3.2. Dedicated brokerage training meetings for the development of innovation potential	P. The number of organised training and brokerage meetings	Pieces	0	340
		R. Number of businesses supported in the consultancy and legal area	Pieces	0	35 thousand
	2.3.3. Activation of entrepreneurship in academia and among young people	P. The number of projects aimed at the creation of a system of financing for innovative initiatives of academic environments and among young people	Pieces	0	1360
		R. The number of grants awarded for the organisation of businesses for the academic environments and among young people	Pieces	0	1360
2.4. Promotion of collaboration and cooperation of economic entities	2.4.1. Supporting the establishment of cooperation and cooperation networking	P. The number of projects aimed at promoting and animating cluster initiatives / cooperation networks	Pieces	0	680
		R. The number of the clusters / cooperation networks created	Pieces	0	min. 15

	2.4.2. Supporting research and development projects carried out in cooperation between the academic and business sectors	P. The number of completed joint research and development projects within regional specialisation	Pieces	0	680
2.5. Providing a financing system of the development of regional innovation potential	2.5.1. Financial support for the development of projects regarding the innovative potential of the region	F. The funds for implementing projects under Priority 2. Development of innovative potential, including: - EU funds - the state budget funds - private funds - the Regional Government funds	Thousands of PLN	0	To be updated after the adoption of ROP 2014-2020 and country projections
Priority 3. Managing the region's innovations					
3.1. Building awareness within the environment that supports the plementation of innovations	3.1.1. Improving the knowledge and awareness of pro-innovation in the local administration	P. The number of initiatives aimed at improving the awareness and knowledge regarding innovation among local government employees	Pieces	0	1360
		R. The number of local government employees who have benefited from initiatives to improve awareness and knowledge	People	0	7 thousand
	3.1.2. Developing an innovation culture and a wider engagement of the society in the process of innovation	P. The number of organised information and promotional events for the public	Pieces	0	680
		P. The number of projects dedicated to customers who aim to present the best practices	Pieces	0	680
3.2. Construction of an innovation management system	3.2.1. Ensuring efficient management mechanisms, implementation, monitoring and evaluation of RIS LORIS 2030	P. The number of jobs (according to EPC) involved in monitoring and evaluating the RIS LORIS 2030	Pieces	0	min. 5
	3.2.2. Raising the skills of human capital in the innovation system	P. The number of organised initiatives aimed at the development of the skills of institutions involved in the implementation of RIS LORIS 2030	Pieces	0	170
		R. The number of employees of the institutions responsible for the implementation of RIS LORIS 2030, who completed training courses aimed at improving skills in innovation	People	0	min.592
3.3. Creation of a system of communication and counselling	3.3.1. Building a support system of communication and counselling	P. The number of operating business environment institutions providing advisory services for SMEs	Pieces	0	min 22
		P. The number of operating entities / coordinators providing services for entrepreneurs within regional specialisation	Pieces	0	min 5
		P. The number of operating entities / technology transfer centres	Pieces	0	min 5

3.3. Creation of a system of communication and counselling	3.3.2. Platform for the exchange / transfer of knowledge / innovation	R. A list of operating functionalities of the Lodz Knowledge Transfer Platform	Pieces	0	min. 3
	3.3.3. Creating a system of ordering and collecting information on the results of research	P. The number of projects aimed at preparing offers of research and development works of academic environments for entrepreneurs	Pieces	0	170
	3.3.4. A platform for cooperation between institutions in support of innovation	P. The number of established institution cooperation platforms supporting innovation	Pieces	0	min. 1
		R. The number of meetings and trainings organised within the established platforms	Pieces	0	136
3.4. Building the framework of a system encouraging cooperation and trepreneurship	3.4.1. Supporting the system to stimulate entrepreneurship	P. The number of projects / programmes supporting the business environment institutions providing comprehensive services to entrepreneurs	Pieces	0	17
		R. The number of companies which have been provided with comprehensive advisory services	Pieces	0	35 thousand.
	3.4.2. Establishing a system of technology brokers	P. The number of projects aimed at the education of innovation technology brokers	Pieces	0	68
		R. The number of technology brokers, who began operations as a result of the implementation of projects aimed at the creation of the brokerage system	People	0	50
	3.4.3. Building a system for cluster policy	P. The number of institutions responsible for conducting the cluster policy	Pieces	0	min. 1
	3.4.4. Supporting innovative investment inflows	P. The number of informational and promotional campaigns targeted at groups of potential foreign investors	Pieces	0	68
	3.4.5. Developing information society services	P. The number of e-services running on the 4th level of functionality	Pieces	0	10
		P. The number of projects aimed at development of broadband network	Pieces	0	15
		R. The number of people who developed their ICT skills after taking part in ICT trainings	People	0	15 thousand
3.5. Providing an integrated system of financing innovation	3.5.1. Creating a system of financing innovation in the region	F. The funds for implementing projects under Priority 3. Managing the region's innovations, including: - EU funds - the state budget funds - private funds - the Regional Government funds	Thou-sands of PLN	0	To be updated after the adoption of ROP 2014-2020 and country projections

Source: Own study.

8.4 Implementation schedule for RIS LORIS 2030 and the plan for the realisation of monitoring works

During the period of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030" operating, it is planned to realise six Framework Action Plans aimed at fulfilling the provisions of the Strategy:

I. Framework Action Plan for the years 2013-2015
II. Framework Action Plan for the years 2016-2018
III. Framework Action Plan for the years 2019-2021
IV. Framework Action Plan for the years 2022-2024
V. Framework Action Plan for the years 2025-2027
VI. Framework Action Plan for the years 2028-2030

Specific projects, which will be designed based on each of the Framework Action Plans, are to be implemented by: the Marshal's Office of the Lodzkie Region, the Marshal's Office in collaboration with external entities, or by third parties.

In addition, the Department of Entrepreneurship of Marshal's Office of the Lodzkie Region will be responsible for preparing annual reports on the implementation of the Framework Action Plans (any advice on the need to amend the Framework Action Plan should be included in the document).

Given the long-term horizon of the functioning of RIS, as well as the rapidly changing market conditions (e.g. changes in the needs of entrepreneurs, emerging new financial instruments, or a change in the legislation), and thus the need for a change of priorities or courses of action, the ability to update the Regional Innovation Strategy is made possible at the end of each Framework Action Plan.

The implementation plan for monitoring works should be temporally correlated with the plans during the implementation of RIS LORIS 2030. Given that the Strategy will be a document implemented by a number of operational and long-term programmes, and in most of them it will be necessary to apply for the funds through a competition process - monitoring will have a key role in communicating the proper conduct of the implementation of RIS LORIS 2030.

Once the document is approved - it will be necessary to establish an entity responsible for monitoring and evaluating the activities carried out within the framework of RIS LORIS 2030 within the structure of the Marshal's Office of the Lodzkie Region. The monitoring works in the area of primary data should remain being carried out in a continuous manner, what is more, the reports on the implementation of RIS LORIS 2030 should be prepared once a year, and the reports on the framework action plan should be prepared every three years.

To conclude, it is worth emphasizing that taking into account the fact that the year 2020 concludes the period of the next financial perspective (2014-2020), it is thereby assumed that additional summary and assessment of the hitherto taken measures in the scope of implementation of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030" will be prepared.

A general schedule for the implementation of the Regional Innovation Strategy for the Lodzkie Region - „LORIS 2030" is presented on the following pages of this report.

Table 39. A schedule of the implementation of the RIS LORIS 2030

	The entity responsible for the implementation of the task	Tasks	Year / Quarter
Preliminary tasks	SM, UM, IZ	Development and adoption of the Regional Innovation Strategy	
	SM, UM	Establishment of the Innovation Counsel	
	UM	Initial state monitoring and baseline indicators determination	
	UM, IZ	Establishment of the Business Environment Institutions System	
	UM	Establishment of cooperation Platforms for key industries and appointment of coordinators	
Continuous tasks	UM	Carrying out activities for the promotion of RIS	
	UM	Monitoring and evaluation of the implementation indicators of RIS	
	UM	Preparation of annual reports on the implementation of RIS	
Framework Action Plan for the years 2013-2015	SM, UM, RI	Development and adoption of the Framework Action Plan (2013-2015)	
	UM, RI, IZ	Planning of projects for implementation	
	UM, IZ, GZ	Implementation of the planned projects	
	UM	Preparation of reports on the implementation of the Framework Action Plan	
	SM, UM, RI	Updating the Regional Innovation Strategy (optional)	
Framework Action Plan for the years 2016-2018	SM, UM, RI	Development and adoption of the Framework Action Plan (2016-2018)	
	UM, RI, IZ	Planning of projects for implementation	
	UM, IZ, GZ	Implementation of the planned projects	
	UM	Preparation of reports on the implementation of the Framework Action Plan	
	SM, UM, RI	Updating the Regional Innovation Strategy	

Year: 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030

Quarter: I II III IV

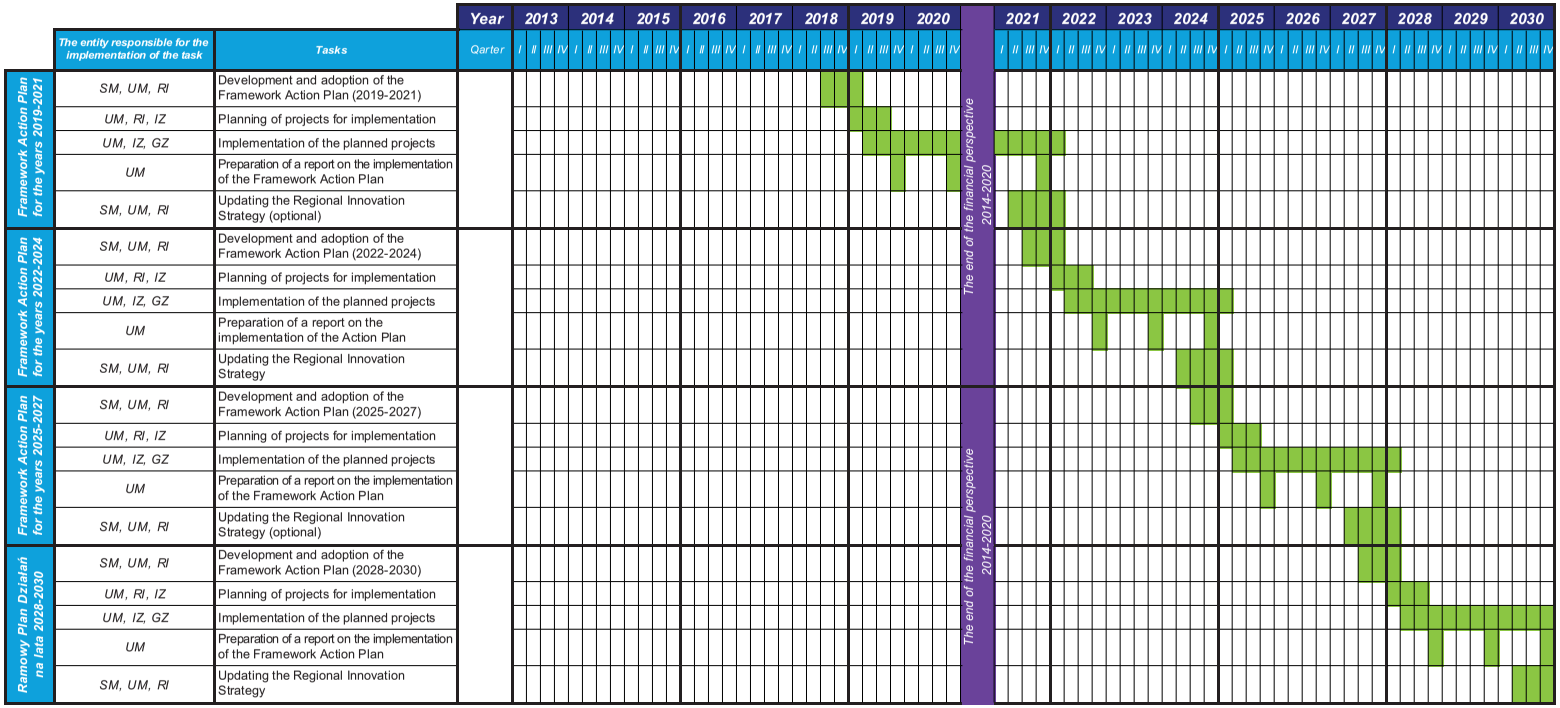
The end of the financial perspective 2014-2020

Abbreviations:

SM - Government of the Lodzkie Region, UM - Marshal's Office in Lodz (Department of Entrepreneurship), RI - The Innovation Council, IZ - external institutions, GZ - Task groups

Table 39. A schedule of the implementation of the RIS LORIS 2030

	The entity responsible for the implementation of the task	Tasks	Year / Quarter
Framework Action Plan for the years 2019-2021	SM, UM, RI	Development and adoption of the Framework Action Plan (2019-2021)	
	UM, RI, IZ	Planning of projects for implementation	
	UM, IZ, GZ	Implementation of the planned projects	
	UM	Preparation of a report on the implementation of the Framework Action Plan	
	SM, UM, RI	Updating the Regional Innovation Strategy (optional)	
Framework Action Plan for the years 2022-2024	SM, UM, RI	Development and adoption of the Framework Action Plan (2022-2024)	
	UM, RI, IZ	Planning of projects for implementation	
	UM, IZ, GZ	Implementation of the planned projects	
	UM	Preparation of a report on the implementation of the Action Plan	
	SM, UM, RI	Updating the Regional Innovation Strategy	
Framework Action Plan for the years 2025-2027	SM, UM, RI	Development and adoption of the Framework Action Plan (2025-2027)	
	UM, RI, IZ	Planning of projects for implementation	
	UM, IZ, GZ	Implementation of the planned projects	
	UM	Preparation of a report on the implementation of the Framework Action Plan	
	SM, UM, RI	Updating the Regional Innovation Strategy (optional)	
Ramowy Plan Działań na lata 2028-2030	SM, UM, RI	Development and adoption of the Framework Action Plan (2028-2030)	
	UM, RI, IZ	Planning of projects for implementation	
	UM, IZ, GZ	Implementation of the planned projects	
	UM	Preparation of a report on the implementation of the Framework Action Plan	
	SM, UM, RI	Updating the Regional Innovation Strategy	



Abbreviations:

SM - Government of the Lodzkie Region, UM - Marshal's Office in Lodz (Department of Entrepreneurship), RI - The Innovation Council, IZ - external institutions, GZ - Task groups

Chapter 9

Finacial framework

9. Financial framework

Experience shows that the objectives imposed on the voivodeship by RIS LORIS 2030 will be closely related to the appropriate use of market-based instruments, and, at the same time, the support of the public sector. The appropriate balance of these two forces will be of key importance in a manner that enables the maximum use of the innovative potential of the lodzkie region.

In using the experience of implementing the innovation policy, both in the lodzkie region, as well as in other regions of the country, it should be assumed that the a model based on external funds will be the most likely financial system to support innovative activities in the region.

In this context, it becomes crucial to create the conditions and mechanisms tailored to the needs of future beneficiaries, which will contribute to both minimising the risk borne by the parties reaching for external funds, as well as stimulate entrepreneurship, innovation-oriented behaviour and raise the willingness to take risk among young people.

At the same time, taking into account that the process of determining the EU budget for 2014-2020 has now entered a decisive phase and soon a final decision on the matter should be expected, it is necessary to take into account in the innovation model the assumptions and funding instruments proposed by the European Commission, aiming to support research, technological development, entrepreneurship and business in the next programme period.

As a part of financing of innovative activity in the lodzkie region, support will be granted to two main categories of innovation:

- **Innovations within regional specialisation (driving forces of growth)** - a group of projects characterised by an outstanding level of innovation on an international scale, belonging to key industries in the region;
- **Basic innovation** - a group of projects with different levels of innovation, contributing to the increase of competitiveness among enterprises and innovation potential of the region, belonging to the industries operating in the voivodeship, with the exception of regional specialisations.

While financing the implementation of the strategy and the business environment institutions that support the construction of the Regional Innovation System will be supported primarily by public funds, the financing of the innovative activity area will offer far more financial mechanisms, including both grants and non-grants. According to the prevailing trend, in the coming years, funding from outside the grant sources will gain in importance, including, above all, the capital, loan, or credit guarantee funds. In addition, during the new programme period (2014-2020), the intervention logic and the targeting of available resources will be subject to fundamental change. The spending formula is going to be modified. Greater importance will be assigned to repayable financing mechanisms (allowing multiple turnovers of EU funds) and raising additional funds from private investors and the public.

In such a wide range of instruments, the key objective for the new funding model for innovation in the lodzkie region will be to form an appropriate structure of use of different sources of funding. This in turn is closely linked to the operation of market mechanisms and the scope of public intervention.

The financial framework for RIS LORIS 2030, taking into account the different financial instruments, is presented below.

It should be particularly emphasized that within the framework of the item “private co-financing” a wide range of non-granting instruments exists, that should constitute significant, and in some cases even a major source of financing the tasks taken within the framework of implementing the regional innovation policy in the Lodzkie Region (among others business angels, PE/VC funds, loan funds etc.).

Table 40. The RIS LORIS 2030 financial framework

Operational objectives	Measures	Sources of funding[66]
Priority 1. Regional specialisation		
1.1. Building awareness of regional specialisation	1.1.1. Integration in the area of key industries	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	1.1.2. Experience exchange programmes at the national and international level	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Funds from national programmes, co-financed by the state budget National programmes, co-financed by external sources Budget of the Programme Horyzont 2020 Private co-financing
	1.1.3. Promotion of industries / key specialisations	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Budget of the Programme Horyzont 2020 Private co-financing
1.2. Construction of the intellectual potential of regional specialisation	1.2.1. Creation of training programmes for the purpose of regional specialisation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The region's budget funds Private co-financing
	1.2.2. Staff exchange programmes between science and business	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	1.2.3. Development of vocational and technical education to meet the needs of regional specialisations	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing

66 Taking into account the demarcation line between national and regional programs financed by the European Union.

Operational objectives	Measures	Sources of funding[66]
	1.2.4. Support for the businesses' needs for training and advice for the purpose of regional specialisation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
1.3. Improving communication in the area of regional specialisation	1.3.1. Preparation of offers for cooperation between science and business	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	1.3.2. Supporting efforts of mutual communication within the specialisation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	1.3.3. Dedicated training and brokerage meetings within the specialisation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region Private co-financing
1.4. Support for cooperation projects within clusters and areas of specialisation	1.4.1. Establishing clear rules for cooperation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	1.4.2. Realising research and development projects within regional specialisation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The Programme Horyzont 2020 Private co-financing
	1.4.3. Support for the process of technology transfer from science to business	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The Programme Horyzont 2020 Private co-financing
	1.4.4. Cooperation, including interregional and international cooperation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The Programme Horyzont 2020 Private co-financing

Operational objectives	Measures	Sources of funding[66]
1.5. Providing a financing system of projects aimed at regional specialisation	1.5.1. Financial support for projects within regional specialisation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The Programme Horyzont 2020 Private co-financing
Priority 2. Development of innovative potential		
2.1. Raising awareness of the benefits of innovation	2.1.1. Shaping the attitudes of pro-innovative entrepreneurs, especially in the SME sector	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	2.1.2. Promotion of regional innovation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
2.2. Promotion of knowledge about innovation and entrepreneurship	2.2.1. Curricula that promote innovation and entrepreneurship at all levels of education	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The region's budget funds Private co-financing
	2.2.2. Promotion of eco-innovation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	2.2.3. Consulting and trainings activities to promote promoting innovation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	2.2.4. Staff exchange programmes between universities and business to promote innovation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
2.3. Platforms for the exchange of experiences and communication	2.3.1. Supporting mechanisms of exchange of information and communication	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing

Operational objectives	Measures	Sources of funding[66]
	2.3.2. Dedicated brokerage training meetings for the development of innovation potential	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region Private co-financing
	2.3.3. Activation of entrepreneurship in academia and among young people	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
2.4. Promotion of collaboration and cooperation of economic entities	2.4.1. Supporting the establishment of cooperation and cooperation networking	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The region's budget funds Private co-financing
	2.4.2. Supporting research and development projects carried out in cooperation between the academic and business sectors	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The Programme Horyzont 2020 Private co-financing
2.5. Providing a financing system of the development of regional innovation potential	2.5.1. Financial support for the development of projects regarding the innovative potential of the region	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The Programme Horyzont 2020 Private co-financing
Priority 3. Managing the region's innovations		
3.1. Building awareness within the environment that supports the implementation of innovations	3.1.1. Improving the knowledge and awareness of pro-innovation in of the local administration	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds
	3.1.2. Developing an innovation culture and a wider engagement of the society in the process of innovation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The region's budget funds Private co-financing

Operational objectives	Measures	Sources of funding[66]
3.2. Construction of an innovation management system	3.2.1. Ensuring efficient management mechanisms, implementation, monitoring and evaluation of RIS LORIS 2030	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds
	3.2.2. Raising the skills of human capital in the innovation system	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds
3.3. Creation of a system of communication and counselling	3.3.1. Building a support system of communication and counselling	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	3.3.2. Platform for the exchange / transfer of knowledge / innovation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds
	3.3.3. Creating a system of ordering and collecting information on the results of research	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds The funds from the ESF
	3.3.4. A platform for cooperation between institutions in support of innovation	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds
3.4. Building the framework of a system encouraging cooperation and entrepreneurship	3.4.1. Supporting the system to stimulate entrepreneurship	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds
	3.4.2. Establishing a system of technology brokers	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing
	3.4.3. Building a system for cluster policy	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds
	3.4.4. Supporting innovative investment inflows	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing

Operational objectives	Measures	Sources of funding[66]
	3.4.5. Developing information society services	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region National programmes, co-financed by the state budget National programmes, co-financed by external sources The region's budget funds
3.5. Providing an integrated system of financing innovation	3.5.1. Creating a system of financing innovation in the region	Programmes co-financed by the EU including Regional Operational Programme of the Lodzkie Region The region's budget funds Private co-financing

Source: Own study.

Chapter 10

Public consultations of RIS LORIS 2030

10. Public consultations of RIS LORIS 2030

From the beginning of the works on RIS LORIS 2030 great significance was given to the principle of partnership and the involvement in the process of development and consultation of the document of all the groups of stakeholders in the region.

The main objective of the public consultations was to ensure inclusion, in the process of preparation of RIS LORIS 2030, of the most important entities of economic life, such as: enterprises, research and development units, local government units, business environment institutions and all entities interested in increasing the region's innovation level. Therefore, the works started with sending the information on the commencement of the works on RIS LORIS 2030 to the main groups of stakeholders in the region and with inviting them for cooperation. The next step was the arrangement of a conference opening the preparation of RIS LORIS 2030, within the framework of which the scope of the planned works and the schedule of the document's preparation were presented.

Within the framework of design works, a series of researches and interviews was carried out, which allowed identification of the needs of particular groups of stakeholders (individual interviews, CATI, CAWI, auditory survey). At the same time, on the website http://biznes.lodzkie.pl, summaries of the results of particular stages of works were published, which allowed the stakeholders to follow the progress of preparation of RIS LORIS 2030 on an ongoing basis, get involved in the process and put up possible remarks. Elaboration of key assumptions of RIS LORIS 2030 was effected in cooperation with expert panels, for which open recruitment was arranged. The elaborated solutions were presented (at particular stages of works) for opinions and approval to the RSI Steering Committee, made of representatives of key stakeholders of the region – representatives of the voivodeship self-government, universities, business environment institutions, entrepreneurs, financial institutions and other regional organizations operating in the area of innovation and modern technologies.

From 8 to 14 January 2013 and from 11 to 21 March consultation conferences were held in particular sub-regions of the Lodzkie Region: northern sub-region, covering Łowicz, Łęczyca and Skierniewice; eastern sub-region, consisting of Bełchatów, Radomsko and Piotrków Trybunalski; central sub-region, covering Brzeziny, Zgierz and Pabianice; western sub-region, covering Poddębice, Zduńska Wola and Sieradz, as well as in Lodz.

In the course of consultations, presented were objectives and scope of works, as well as the method of the project's organization along with schedule, plus progress and effects of the so-far conducted works on the „Regional Innovation Strategy for the Lodzkie Region – LORIS 2030". At consultations, discussion panels were held with participation of all the members, who were able to express their opinions, put up remarks and suggestions as to the initial version of the document. The consultations were participated in by almost 700 members.

In the course of consultations emphasized was above all complexity of the document, coherence of the layout of strategic and operational objectives, as well as its practical (implementation) nature. Major comments put up by the participants related among others to the indication of necessity to ensure the implementation of RIS LORIS 2030 and to rearrange the indicated financing objectives, including within the framework of the Regional Operational Programme for the Lodzkie Region for the years 2014-2020.

Additionally – within the framework of the consultation process – there was a possibility to put up remarks to the RISI LORIS 2030 project with the use of a form published on the website http://biznes.lodzkie.pl. In total, 350 remarks, comments and opinions regarding the document have arrived, including: 234 remarks from the departments of the Marshal's Office of the Lodzkie Region and the entities subordinate to the Voivodeship Self-Government, 78 remarks within the framework of electronic form from entrepreneurs, business environment institutions, local government units etc.

The remarks and opinions presented in the course of the consultation process were recorded and employed at developing the final shape of the Regional Innovation Strategy for the Lodzkie Region LORIS 2030.

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5.	Podręcznik Oslo http://www.mg.gov.pl/NR/rdonlyres/3B2E3AC5-CBDE-47D4-AF6A-3ED270D74965/52556/Ekspertyza.pdf
6.	www.bankier.pl
7.	www.biotechmed.pl
8.	www.biznes.lodzkie.pl
9.	www.e-biotechnologia.pl
10.	www.lwif.pl
11.	www.paiz.gov.pl
12.	www.parp.gov.pl
13.	www.pfb.info.pl
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19.	www.ure.gov.pl
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Attachment 1. Proposals for pilot initiatives

Pilot initiatives should include system initiatives and initiatives self-identified as key to the implementation of the RIS LORIS 2030.

Individual initiatives - are understood as projects carried out by the beneficiaries of the RIS LORIS 2030.

As a part of the preparation of this document, a call for proposals for projects that could be undertaken within the RIS LORIS 2030 was announced. The aim was to verify whether the objectives are in line with the expectations of potential projects and to possibly supplement the planned support under the prepared innovation policy in the region. The information obtained on the proposals of potential projects can form the basis for the selection of key individual projects by Lodzkie Region Government (the Marshal's Office of Lodzkie Region).

System initiatives - are understood as initiatives aimed at improving the efficiency of the Regional Innovation System in the lodzkie region.

In the case of system initiatives, the undertakings for the provision of efficient mechanisms for the management and implementation of RIS LORIS 2030, as well as the institutional support available to entrepreneurs, should be carried out first.

The proposals of key initiatives from the perspective of building an effective and efficient Regional Innovation System for the implementation of RIS LORIS 2030 are presented below.

Name of the initiative	Support for building of the management, implementation, monitoring and evaluation system of RIS LORIS 2030
Description of the initiative	Adapting the organizational structure to the needs of the new Strategy requires the Marshal's Office of Lodzkie Region to assign responsibility for the implementation of RIS LORIS 2030 and ensuring cooperation and information flow within the Regional Innovation System to a selected organizational entity. This cell should be responsible for the preparation of effective mechanisms for management, implementation and monitoring of RIS LORIS 2030. In addition, it should coordinate the tasks identified for implementation under the Strategy and oversee the implementation of the planned tasks by the competent bodies set up for this purpose under the Regional Innovation System. Ensuring the principle of partnership in the implementation of RIS LORIS 2030 also requires the inclusion of the supervisory body, consisting of the main actors of economic life, such as companies, research entities, local governments, business institutions and representatives of regional organizations in the field of innovation and technology into the monitoring, which will be responsible for strategic decisions regarding the implementation of RIS LORIS 2030. An important issue in this area will also be the adequate empowerment of individual entities in the management, implementation, monitoring and evaluation system of the RIS LORIS 2030.
Planned measures	Within the project, certain measures should be completed, in order to: • Appoint entities to the organizational structure for implementation, monitoring and evaluation of the RIS LORIS 2030; • Indicate the division of responsibilities of the various institutions in the Regional Innovation System; • Indicate the division of activities in the main processes carried out within the frameworks of the RIS LORIS 2030; • Develop a process, methods and a schedule for monitoring the progress of implementation of the RIS LORIS 2030, and a system of reporting and implementation of tools to gather information in this regard;

Planned measures	• Preparation of tools for conducting periodic evaluations and analysis of the state of implementation of the RIS LORIS 2030, and development of the principles of communication of assessment and analysis results to stakeholders, especially to the RIS LORIS 2030 management structures; • Carry out a detailed qualitative and quantitative analysis of available sources of funding and develop a matrix of satisfying needs with an indication of the funding gaps in the region; • Develop a programme of developing financial instruments to support the development of innovation based on the assumptions of RIS LORIS 2030; • Adapt the assumptions and priorities of the ROP of the Lodzkie Region for years 2014-2020 to create a system of financing innovation within the RIS LORIS 2030;[67] • Identification of the entities operating in areas indicated as industries / specialisations crucial for the region; • Appoint entities that are coordinators in a cooperation network in the areas of the industries crucial for the development of the voivodeship; • Prepare a cluster development policy, using the potential of the Lodz Special Economic Zone, including the preparation of a cluster development plan and the development of a training and advisory and financial support system for clusters, and the preparation of systems to assess and monitor the development of clusters in the region, with particular emphasis on key clusters; • Development of the principles of forecasting and implementation of changes in the RIS LORIS 2030 as a result of research results, and communicating them to the stakeholders of the strategy.
Planned products and results	• An established organisational structure with a clear division of responsibilities of the various institutions for the implementation, monitoring and evaluation of the RIS LORIS 2030; • Monitoring tools and methods for collecting information on the progress of the implementation of RIS LORIS 2030; • A programme for the development of instruments of financial support for the development of innovation, based on the assumptions of the RIS LORIS 2030; • Adaptation of the assumptions and priorities of the ROP of the Lodzkie Region for years 2014-2020 to create a system of financing innovation within the RIS LORIS 2030; • A cluster development plan and a prepared training and advisory and financial support system for the clusters; • Periodic evaluation and analysis of the state of the implementation of RIS LORIS 2030; • Upgrade policy for the RIS LORIS 2030 and communication of the changes to the stakeholders of the strategy.
Beneficiaries	• Marshall's Office of Lodzkie Region.

Name of the initiative	Support for the operation of the Technology Transfer Centres network
Description of the initiative	For entrepreneurs wishing to obtain information on the possible transfer of technology, the most important issue is the availability of information and the ability to identify the entities from which they will be able to obtain the right support. That is why one of the most important issues is to build a transparent and clear institutional system to support technology transfer in the region, which will ensure an adequate flow of information and the necessary consulting support. Therefore, the aim of the initiative will be the establishment of Technology Transfer Centres network, based on a consortium of entities currently operating in the lodzkie region, which will conduct specialist business support regarding the issues related to technology transfer. These entities would be responsible for communication and information flow between companies and scientific institutions in the region, and advice in technology transfer, as well as advice on other forms of cooperation between business and science.
Planned measures	• Preparation and implementation of the concept of the operation of the networks; • Identification of the scope of responsibilities of each Technology Transfer Centre; • Recruitment of qualified personnel; • Providing training and consultancy in the field of technology transfer; • Accumulation of knowledge generated in their native entities and other R&D entities operating in the region, preparing offers for the possible areas of cooperation between the science and business sectors, including the replenishment of the Lodz Knowledge Transfer Platform resources; • Assisting in establishing cooperation between universities and companies, both nationally and internationally; • Activation and support for the technology transfer processes between science and business, including legal advice; • Preparation of offers of specialised services in the field of technology transfer for entities from functional areas and key industries / specialisations; • Providing assistance in initiating projects within the vein of academic entrepreneurship; • Supporting a network of specialisations coordinators and a network of 22 business environment institutions regarding training and consulting; • Other activities identified at the stage of preparing the system project.
Planned products and result	• Establishing a network of Technology Transfer Centres; • Ensuring the stability of the network by providing funding for staff and operations in the designated responsibilities; • A list of activities and entities for which Technology Transfer Centres' activities were implemented; • A list of trainings and meetings handled by the Technology Transfer Centres; • And other activities identified at the development stage of the system project.
Beneficiaries	A consortium / network of Technology Transfer Centres currently operating in the lodzkie region.

67 Taking into account the line of demarcation between national and regional programs financed by the European Union

Name of the initiative	Supporting the construction and operation of the network of 22 business environment institutions available at the county level
Description of the initiative	For businesses operating at the level of particular counties and municipalities, an important issue is the easy availability of information and the ability to identify the businesses from which they can obtain the right support for the feasibility of innovative projects at the local level. Therefore, one of the most important issues is to build a transparent and clear institutional system supporting innovation that will ensure proper information flow and consulting support necessary for enterprises at the level of each county. Crucial in this matter is the easy identification of the entity, which can be contacted by the company and asked about the feasibility of innovative projects, about obtaining precise information on the available support and accurate referrals to another institution, which specifically deals with the issue reported in detail, e.g. the Technology Transfer Centre, a business incubator, etc. Therefore, the initiative will aim to establish the network of 22 business environment institutions, based on the institutions currently operating in the counties, designed to support SMEs. These institutions will be identified within the entities available at the level of each country.
Planned measures	• Preparation and implementation of the concept of operation of the coordinator and the network; • Identification of the scope of responsibilities of the coordinator and the individual 22 business environment institutions; • Recruitment of a qualified staff; • Providing training and advice to businesses within the individual counties in the capabilities of preparing and executing innovative projects; • Accumulating knowledge about the companies operating in various counties, with particular emphasis on the functional areas and sub-region growth centres in particular sub regions of Lodzkie Region, preparing information about the offer of cooperation possible between the science and business sectors, including the replenishment of the Lodz Knowledge Transfer Platform resources; • Assisting in establishing cooperation with the entities involved in specialist support and advice, such as: Technology Transfer Centres, science and technology parks, incubators, etc.; • Activation of companies operating within the county, indicating the benefits of innovation regarding the creation of cooperation networks, possible sources and methods of financing of innovative projects; • Creating platforms of experience exchange at the level of functional areas; • Other activities identified in the preparation of the system project.
Planned products and results	• Ensuring an active operation of the coordinator and a network of 22 business environment institutions available at the level of each county; • Ensuring the stability of the network by providing funding for staff and operations in the designated responsibilities; • A list of measures and entities for which measures were carried out by the coordinator and the 22 business environment institutions; • A list of trainings and meetings handled by the coordinator and the 22 business environment institutions; • And other activities identified at the development stage of the system project.
Beneficiaries	The network coordinator and 22 business environment institutions currently operating (established in the absence of the option to choose from the currently existing institutions) at the level of each county.

Name of the initiative	Establishment and support of the operation of a network of coordinators for regional specialisations
Description of the initiative	To ensure the correct development of regional specialisation in the lodzkie region, it is necessary to ensure the proper information flow and advisory support for companies operating in the areas of specialisation. The coordination of the activities carried out for the selected specialisations will be crucial to this matter, as well as providing easy identification of the entity to which the entrepreneurs and entities operating in the areas of specialisation will be able to go to. This project will be the starting point for the integration of entities operating in the specialisation, and showing these entities the benefits of their inclusion into the cooperation network. Therefore, the aim of the initiative will be to establish a network of coordinators for regional specialisations, entities involved in the coordination of activities within the regional specialisations in individual industries.
Planned measures	• Preparation and implementation of the concept of the network; • Identification of the scope of responsibilities of the coordinators; • Recruitment of a qualified staff; • Analysis of the needs of the entities and possible areas of cooperation, including an indication of the benefits of joint initiatives in selected areas of specialisation; • Definition of pilot projects that can be implemented in the areas of key regional specialisations; • Providing trainings, meetings and promotional campaigns designed to identify opportunities for integration and implementation of joint projects to entities operating in areas of industries crucial to the development of the region; • Accumulating and building knowledge in the areas of specialisation, including the acquisition of knowledge about the offer of R&D entities operating in the region within the chosen specialisation; • Supporting the establishment of cooperation between enterprises and the R&D sector; • Searching for potential business partners from abroad for companies operating in the areas of specialisation, organisation of direct bilateral meetings of entrepreneurs, assistance in the organisation of business missions and / or participation in international fairs; • Replenishment of the Lodz Knowledge Transfer Platform resources regarding current activities and initiatives in selected areas of specialisation; • Referring to the relevant entities providing specialist support in selected areas of specialisation; • Other activities identified at the preparation stage of the system project.
Planned products and results	• Establishment of a network of regional specialisations; • Ensuring the stability of the network by providing funding for staff and measures in the designated responsibilities; • A list of measures and entities for which measures were carried out by the selected coordinators; • List of trainings and meetings handled by the coordinators; • And other activities identified at the development stage of the system project.
Beneficiaries	Entities set up by the Lodz Voivodeship Regional Ggovernment to be the regional coordinators for specialisations in areas of industries crucial to the development of the region.