

REGIONAL ANNEX TO NATIONAL RIS 3 FOR THE MORAVIA-SILESIA REGION

Contracting Authority:

Moravia-Silesia Region

Prepared by:

Regional Development Agency, joint-stock company

May 2014



CONTENTS

1.	ANALYTICAL PART	3
1.1	POSITION OF THE REGION.....	3
1.2	R&D IN THE REGION, INNOVATIVE BUSINESS.....	4
1.3	PUBLIC ADMINISTRATION AND ITS ROLE IN THE REGION'S INNOVATION SYSTEM.....	5
1.4	MAIN ACTORS IN THE INNOVATION SYSTEM - RESULTS OF THE STAKEHOLDER ANALYSIS	10
1.5	SWOT ANALYSIS	17
1.6	METHODOLOGY OF PREPARATION OF THE REGIONAL ANNEX	20
2.	PROPOSAL PART	22
2.1	VISION.....	22
2.2	GLOBAL OBJECTIVE	22
2.3	KEY CHANGE AREAS	22
2.3.1	KEY CHANGE AREA A: TECHNOLOGY TRANSFER.....	23
2.3.2	KEY CHANGE AREA B: HUMAN RESOURCES	27
2.3.3	KEY CHANGE AREA C: INTERNATIONALISATION.....	31
2.3.4	KEY CHANGE AREA D - COORDINATION AND IMPLEMENTATION OF THE RIS	33
2.4	VERTICAL PRIORITY AREAS - TECHNOLOGY DOMAINS	36
2.5	IMPLEMENTATION STRUCTURE	37

SRIS
RIS
SRIS
RIS

1. Analytical Part

1.1 Position of the Region

The Moravia-Silesia Region is an industrial region with a long-standing tradition, which continues to experience a gradual restructuring consisting in “downsizing and optimizing” the traditional industries (mining, metallurgy, mechanical engineering, energy) and the development of promising new sectors (automotive, IT and electrical engineering, biotechnology). These sectors are linked to a broad spectrum of participants in the first two poles of the triple helix (companies, knowledge institutions).

Since 2010, the new RIS of the Moravia-Silesia Region 2010-2020 has been implemented; it gradually helped create a group of active actors of the innovation system of the region who regularly engage in activities and projects under the existing RIS. The Innovation Council of the Moravia-Silesia Region, the executive team of the RDA for the implementation of RIS, two functioning expert working groups (to support start-ups: bringing together business incubators and science and technology parks; ClusterNet - to support clusters in cluster management with an emphasis on research and development activities including intersectoral cooperation) and a generally increasing involvement of intermediary organisations to support innovation are the key underlying organisational and professional requirements to ensure a successful implementation of the RIS3 of the Moravia-Silesia Region 2014-2020.

Despite the gradually increasing cooperation among the actors of the innovation system of all the poles of the triple helix, the coordination of their activities, which should be based on their common interests and needs, is not easy. Overall, to achieve the desired effect of the use of the results of research and development in the form of specific innovations in the application sector based on the concept of specialised research areas, it is necessary to motivate key businesses in the region to get involved in these activities, including financial participation. On the other hand, it is necessary to require the central authorities to adopt a systemic and conceptual approach to the creation and implementation of the national innovation system and encourage knowledge institutions to increase the flexibility of cooperation with the business sector.

One of the major problems that are typical not only for the Moravia-Silesia Region is the lack of technical labour force due to a lack of interest of young people in studying technical fields. Regarding human resources in RDI (particularly in relation to research centres funded by the OP RDI at VŠB-TUO), in terms of quantity there is a relatively sufficient number; however, in terms of quality, the situation is less favourable (a possible solution may be for example a more intense acquisition of foreign researchers).

As for the statistical evaluation of the innovation performance of the Moravia-Silesia Region, it may be said that a number of indicators have significantly improved in the case of the Moravia-Silesia Region over the three monitored years. The Moravia-Silesia Region can be positively evaluated in R&D expenditure on R&D personnel in general and in the corporate sector, in the number of R&D employees and researchers, in the introduction of new product innovations for enterprises, in process innovation, in the intensity of the acquisition of new machinery and equipment for R&D activities and in R&D expenditure on the higher education sector. The Moravia-Silesia Region is also doing very well in gross fixed capital formation, the share in the GDP of the Czech Republic (in the long term about 10 %), exports (on average the third place) and the number of patents granted (except public research institutions). In comparison with the other regions, the Moravia-Silesia Region is above average in the drawing of funds from the OP EI in areas targeted at innovation support (i.e. ICT-Strategic Services, Potential and Innovation; so far the main part was the construction of development centres in companies). The wage level is above average in the Moravia-Silesia Region, which is due to a greater presence of large Czech and foreign enterprises in comparison with the other regions.

The situation is average in the Moravia-Silesia Region in the case of the introduction of organisational and marketing innovations because of the still apparent relative underestimation of these types of innovations in enterprises in the region. The Moravia-Silesia Region has a negative balance of the technology balance of payments, which is due to the relatively high cost of acquisition of royalties and trademarks that companies in

the MSR need for their development and production activities;

in other sub-areas (computer services, R&D activities and technical services, with the exception of property rights), the balance of the region is active.

The Moravia-Silesia Region is below average in the case of expenditure on R&D in absolute value in the corporate sector, and the related innovation activities of small and medium-sized companies, innovation in services (due to the still low orientation of the region at the services sector - a large portion of the regional GDP is still formed by industry), the purchase of services in research and development (companies use these services in a limited way - they either implement research and development themselves or not at all) and product innovation new to the market (dominated by incremental innovation of process type, or innovation of existing products of both lower and upper ranks).

A long-term problem of the Moravia-Silesia Region is a generally high unemployment (the second largest in the Czech Republic, with a growing share of the long-term unemployed as a result of the ongoing restructuring of the economy of the region), and a smaller proportion of economically active labour force (in relation to population - due to the general ageing of the population, the outflow of young people and a large number of people suffering from occupational diseases). The Moravia-Silesia Region relatively underutilises resources from the 7th Framework Programme of the European Commission (only 0.45 % of the total R&D expenditure in the region is covered by this programme) - this is due to the aforementioned low innovation activity of small and medium-sized companies, a generally low awareness of programmes to promote international research cooperation and the persistent language barrier. Overall, the potential for international research cooperation in the above-mentioned key sectors is relatively little used, which is in addition to the low innovation activities of small and medium-sized companies caused by "in-house" research, development and innovation activities of large Czech companies, the exclusively manufacturing activities of some subsidiaries of multinational corporations and partly also by fewer opportunities for international research collaboration with knowledge institutions.

1.2 R&D in the Region, Innovative Business

The private sector in the region is rich in large enterprises (both foreign and Czech, with the exception of biotechnology as a completely newly established field) investing quite heavily in RDI; nevertheless, there are technologically advanced SMEs as well. In the case of SMEs it is clear, however, that their innovation activity is generally limited, which also implies that research, development and innovation activities in the region are mainly driven by large companies.

As regards knowledge institutions, a dominant role is played by VŠB - Technical University of Ostrava, followed by the University of Ostrava, the Silesian University and other public research institutions (the Institute of Geonics of the ASCR, the Ostrava University Hospital, the Ostrava Health Institute) as well as private ones. In the case of VŠB - Technical University of Ostrava, the focus of its research activities corresponds to the profile of the region's private sector, which is a big advantage and opportunity for the development of applied research of a critical scope. This is similar in the case of the University of Ostrava in the sector of biotechnology and health care.

The mentioned sectors (metallurgy - mechanical engineering, automotive, IT and electronics, energy, biotechnology) serve as the basis for a number of promising research directions, whose results have a broad impact on a wide range of sectors and are in line with global technological trends - particularly in terms of advanced materials, low cost automation for manufacturing and testing, mechatronic systems, regenerative medicine, genomics and related data analysis, the processing and subsequent use of raw materials, secondary raw materials and waste, the issue of smart grids, smart cities and the related combined production of electricity and heat generation, integrated security systems and supercomputing methods (simulation, modelling) with cross-cutting application for all of the above research directions, or for other purposes of socio-economic nature. These areas of research specialisation are of common interest to companies,

universities, research institutes and cluster organisations, thus creating many opportunities for a mutually beneficial cooperation between these entities. With the sectoral profile of the region and sub-implemented research activities, there is a wide range of possibilities for cross-sectoral research, whose output may be new breakthrough technologies and products (e.g. the interconnection and further development of research in the automotive industry and information technology, information technology and energy, information technology and biomedicine, nanotechnology and mechanical engineering, materials engineering and the automotive industry, etc.).

The potential for a very interesting cooperation in the sectoral and cross-sectoral dimension is not yet sufficiently utilised. This is due to the research capacity of large companies and the related tendency of the implementation of “in-house” research, the persistent low motivation of researchers in knowledge institutions to collaborate with the private sector in applied or contractual research, and the already mentioned innovation activity of small and medium-sized companies operating in a number of cases as standard suppliers producing on the basis of precise technical specifications (these companies thus do not demand applied or contractual research in knowledge-based institutions, or they demand it only to a limited extent; knowledge institutions then do not have an accurate idea of the possibilities of cooperation with these companies).

New opportunities to gradually strengthen the cooperation of the private and academic sectors lie in research centres located at VŠB-Technical University of Ostrava (financially supported from the OP RDI), the most important of which is the supercomputer centre IT4Innovations; the other research centres are focused on materials research and alternative energy and environmental technologies. An important achievement in the field of applied research in biotechnology is the building of a biotechnology park, 4MEDI, with a total investment cost of CZK 1 billion (funded by the OP EI), which will specialise in particular in research and development of stem cells and become the most modern facility of its kind in Europe (investor: Primecell, s. r. o., a major partner of the Ostrava University Hospital).

1.3 Public Administration and its Role in the Region’s Innovation System

Below is a list of current analyses, surveys and strategy documents that cover the issue of research, development and innovation in the MSR:

Regional Development Strategy (2009-2020)

This is the strategy of the Moravia-Silesia Region until 2020, which includes an analysis of the current situation and the assumption of the regional development in defined areas. The implementation of the development strategy of the Moravia-Silesia Region for the period between 2009 and 2020 is carried out through the implementation of specific projects and activities, both those that are identified and listed in the descriptions of the specific strategic objectives and those that will be new and that correspond to the definition of these objectives. These are projects whose implementer is the Moravia-Silesia Region and also projects across a range of institutions and organisations both in the public and private sectors. The implementation of the strategy is thus ensured by the activity of these entities, in many cases under various forms of partnership. The responsibility for the physical implementation of all the projects thus does not rest with one institution. The process of annual monitoring of the strategy implementation is based on the following assumption: the basic level of the strategic part of the document that is valid for the entire proposal period consists in vision and global strategic objectives. The level of specific strategic objectives and implementation projects shall be subject to periodic audits that, in addition to the evaluation of existing specific objectives and projects, may propose a modification of this level of the proposal part of the Strategy in response to current conditions.

Regional Innovation Strategy for the period between 2010 and 2020

The RIS was prepared in 2009 and approved by the Regional Council in 2010. The RIS is a good starting basis for processing the RIS3 of the Moravia-Silesia Region for 2014 - 2020. It is not necessary to create a new document; the document should only be completed and specified in certain areas: define the areas of research specialisation, clarify specific objectives, get key enterprises more involved in the implementation of the RIS,

create pro-innovation atmosphere, develop a communication plan, incorporate the use of new EU funding (not only the OP EIC and OP RDE, but also other community programmes of the European Commission - Horizon 2020, Cosme, Eureka, etc.), take into account the position of the region (the overall innovation potential and the choice of areas of research specialisation) in relation to the neighbouring regions as well as in the broader context of the EU, finalise the evaluation system (at the level of actions and global objectives).

Competitiveness Strategy of Ostrava for the period 2012 - 2020

The document is supposed to show the direction in which the city should move, identify key areas for its development and increase its competitiveness. As part of this strategy, key factors and issues of the Statutory City of Ostrava are analysed and three axes of competitiveness within which projects are recommended for implementation of this strategy are defined. The implementation of the Strategy is slowly starting. In relation to innovation, sub-tools are implemented (for example the Microloan Fund for SMEs as a joint programme of the region and the city). The proposed measures are very expensive and are therefore implemented gradually, as the city receives funds for their implementation.

Study of the business incubators in the Moravia-Silesia Region

The study was prepared for the purpose of mapping the situation in the promotion of start-ups in the region. The aim of the study was to process and verify information concerning the provision of services to potential entrepreneurs/companies. The second step was to evaluate whether these facilities meet the characteristics/functions of a business incubator. 5 entities meeting the characteristics were identified; these entities provide services to potential entrepreneurs/companies and through a number of different tools try to stimulate innovative business in the region (competitions, follow-up start-up accelerator, professional counselling services for existing start-ups, etc.). During the preparation of the study, the interest of these entities in cooperation, sharing experience and finding common projects was identified; this resulted in the creation of a platform - the “start-ups” working group.

Study of value chains in the Moravia-Silesia Region

This is an analysis of the current and expected future state of the five key sectors in the region (metallurgy - mechanical engineering, automotive, IT and electrical engineering, energy and biotechnology) in production and research activities, supplier-customer relations and export potential in order to identify possible areas of research specialisation preferred by the private sector for inclusion in the RIS3 of the Moravia-Silesia Region 2014-2020.

The study indicates promising areas of research and development activities with the potential for inclusion in the RIS3 of the Moravia-Silesia Region:

- Metallurgy - Mechanical engineering: modern materials (steel, alloys, composites), follow-up finishes (nanotechnology applications), increasing the useful properties of the manufactured products, reduction in the production costs, machining technology (adaptation by companies for their specific needs, material recovery), mathematical modelling in the development of machine parts and technology for laser sintering of metals and plastics (LSM);
- Automotive: advanced materials (alloys, composites, aluminium, plastic) - in line with the trend to reduce the weight of cars (to achieve a lower fuel consumption, lower CO2 emissions), energy storage systems (incl. regenerative technologies) - for the purposes of electrical mobility, the technology of automatic identification of movement of components and products in order to increase productivity and quality - use not only in manufacturing but also in logistics processes (e.g. RFID);
- IT + electrical equipment: e-commerce, business intelligence (especially ERP), mobile technology, applications for smart grids and health care systems, cloud systems, measuring and testing systems for the industrial production and energy;
- Energy: energy savings and the efficiency of use of raw materials (conventional and nuclear power), energy recovery of waste - pyrolysis, fermentation; increasing the energy efficiency and use of solar and geothermal energy sources, co-generation units (combined production of electrical energy and heating),

storage systems, smart grids - intelligent energy networks, electrical mobility (fast charging stations);

- Biotechnology: regenerative medicine (stem cells), genomics, bioinformatics and analysis of medical data (e.g. RFID), nanobiosensors and nanoprinting (3D); and
- Waste processing: recycling, waste-free technologies in production processes, etc.

Study of research and innovation activities of knowledge institutions and cluster organisations

This document covers the key research activities of those institutions which have the potential for applications in the private sector and are thus suitable for possible inclusion in the RIS3 of the Moravia-Silesia Region 2014-2020. The range of areas of research activities of knowledge institutions and clusters is wide. In terms of similarities, connections, possible follow-up and networking of research activities in these organisations, the following research activities may be seen as crucial for the final selection of the areas of research specialisation within RIS3 of the Moravia-Silesia Region:

- Materials research (advanced materials including nanomaterials for a wide range of sectors - mechanical engineering, the automotive sector, medicine, etc.), surface finishing;
 - Environmental technologies - energy recovery from waste and fuels, energy efficiency and savings, waste-free technologies, smart energy networks;
 - Business intelligence (especially ERP), e-commerce;
 - Software for crisis management, integrated security systems;
 - Research on platelets, vascular disease, stem cells;
 - Machine technology, precise machinery parts;
 - Electrical mobility and the related infrastructure;
- with a relevant use of supercomputing (IT4I) for the above-mentioned research areas.

Study of intermediary institutions to support innovation

The key intermediary institutions include the Moravia-Silesia Region (administration of grant programmes to support RDI processes), the Regional Development Agency (the executive body for the implementation of the RIS of the Moravia-Silesia Region, its processing and updating), the Statutory City of Ostrava (the Competitiveness Strategy of Ostrava for 2012-2020) and business incubators providing discounted consulting and mentoring services to support young innovation businesses - start-ups and spin-offs (this is a very important activity because the intensity of the establishment of new enterprises in the region is relatively low, owing to the long-term historical habit of the labour force to work in large enterprises) . The activities of other organisations (workshops, seminars for entrepreneurs to promote export, on the topics of new technical standards, matchmaking meetings to promote business cooperation, etc.) are complementary to the activities described above.

Statistical analysis of the innovation performance of the Moravia-Silesia Region

This document serves to compare the Moravia-Silesia Region and the other regions of the Czech Republic and selected foreign reference regions in specific statistical indicators to determine the position of the region in the national and international context.

Below is a list of the existing schemes to support research, development and innovation processes in the Moravia-Silesia Region:

Name of scheme, support or project	Funded and implemented by	The financial allocation in the last 2 years	A brief evaluation - for whom, results, benefits	Note
Promoting cooperation and knowledge transfer between universities or research organisations and small and medium-sized enterprises (innovation vouchers).	Region since 2010	CZK 9.5 million since 2013	For SMEs and the academic sector.	An established programme. Not fully drawn in the first year. A great interest in the subsequent years. Now demand is always in excess.
Support for research and development activities of enterprises through the provision of non-investment grants to co-finance staff costs for newly created jobs in research and development.	Region since 2013	2 million	For SMEs	It is a new grant scheme.
Support for the creation and development of high-quality R&D teams and their further development in science, mathematics and physics, medical and technical fields implemented in the Moravia-Silesia Region.	Region since 2013	20 million	Academic sector	
Support for research and development activities by providing targeted subsidies in the fields of research: technical sciences, natural sciences, medical sciences, social sciences.	Region since 2009	3.6 million in 2013	Academic sector	
Support for talented Ph.D. students and graduates.	Region since 2010	1.1 million in 2013	Academic sector	Provided to the school, the school provides to students/graduates.
Support for the creation and development of innovation start-ups (start-up businesses) in business incubators, science and technology parks and business and innovation centres.	Region since 2013	0.5 million in 2013	Business incubators	It is a new grant scheme.
Support for students and graduates of secondary schools and universities in the Moravia-Silesia	Region since 2013	0.5 million in 2013	Students	It is a new grant scheme.

Name of scheme, support or project	Funded and implemented by	The financial allocation in the last 2 years	A brief evaluation - for whom, results, benefits	Note
Region in the establishment and development of new businesses with innovation business plans.				
Microloan Fund for SMEs for innovation activities projects (a joint programme of the region and the City of Ostrava).	Region since 2013	CZK 5 million in 2013	SMEs	The funds were provided by the City of Ostrava and the Moravia-Silesia Region. Administered by the region.
Competition - Innovation Company of the Moravia-Silesia Region.	RDA since 2013	Financial gift. The first 3 places awarded. (1st - 50 thousand, 2nd - 30 thousand, 3rd - 10 thousand)	SMEs	the first year, 22 applications.
The involvement of foreign experts in research projects and lectures implemented in the Moravia-Silesia Region.	Region between 2010 and 2012	CZK 2.9 million per year	Academic sector.	
Support for talented students in their first year of the Bachelor's study in the Moravia-Silesia Region through the provision of subsidies in the first two semesters of the first year.	Region between 2010 and 2012	CZK 600 thousand	Students.	
Green Light	VŠB - ISC 2013	CZK 450 thousand (source: own resources + donations)	Students.	The competition for the best business idea, subsequently the best entrepreneur. Intention - based on the development of ideas in the start-up accelerator. This is a new activity.
Incubator Idea	STP Ostrava since 2007	CZK 64 thousand (own resources)	Students, potential entrepreneurs.	Validation and further development of an innovation business idea - until the stage of a business plan - for students and other potential start-ups; then a transition into a

Name of scheme, support or project	Funded and implemented by	The financial allocation in the last 2 years	A brief evaluation - for whom, results, benefits	Note
				technology incubator and launch of the business plan.
Pre-incubation	Steel IT BI since 2010	CZK 50 thousand (own resources + funding by Třinec)	Students, potential entrepreneurs.	The development of an innovation business idea up to the stage of a business plan - based on the verification of the applicability of the idea in the market. A low number of high-quality business ideas
Student grant competition	VŠB-TU Ostrava since 2008	CZK 15 million (indicative amount)		Financing of science-oriented Master's theses and dissertations. An established tool.
Institutional development project	University of Ostrava since 2010	CZK 4 million (indicative amount)		Financing of science-oriented work of Ph.D. students. An established tool.

Grant programmes of the region are evaluated by the region and the Regional Development Agency. On the basis of the assessment, the conditions are revised or the programme is amended/terminated. It is always necessary to take into account the "introductory" phase of the programme, where the programme does not show any particular results because of its novelty (until the implementers learn to use it). The programmes are therefore not evaluated immediately after the first year.

In the long-term, the greatest interest is in "innovation vouchers" - programme since 2010. In recent years, there is a higher number of applicants than the programme is able to satisfy. There was also one call under the ROP of the Moravia-Silesia Region; however, it was not used by applicants due to its administrative demands.

1.4 Main Actors in the Innovation System - Results of the Stakeholder Analysis

Knowledge institutions and clusters

In the Moravia-Silesia Region, there is a wide range of knowledge institutions with extensive research programmes. The following paragraphs describe the research areas that are common to them, or those on which they work together and that are supporting of the Moravia-Silesia Region (human resources, financial resources and technical equipment):

1. Materials research - stainless steel, alloys, composites, with a wide use in mechanical engineering, the automotive industry, energy, health care, nanotechnology applications in surface modification of these materials (coatings, friction surfaces, etc.), the technology of combining various kinds of materials, for example metals and plastics (LSM technology - laser sintering of metals and plastics). The implementers of these research activities are VŠB-TUO - the Faculty of Metallurgy and Materials Engineering, the Regional Materials Science and Technology Centre - sustainability programme, MATERIAL AND METALLURGICAL RESEARCH, limited liability company, VÚHŽ, a. s. (Iron Research Institute).

2. Environmental technologies - energy processing of industrial and biological waste and used fuel, energy efficiency and savings (electricity and heat - for manufacturing processes, residential spaces, accumulation and distribution of thermal and electric energy), waste-free production technology (especially for mechanical engineering and the automotive industry), co-generation technology and smart energy networks (smart grids). The implementers of these research areas are VŠB-TUO - the Faculty of Mechanical Engineering, the Faculty of Mining and Geology, the Faculty of Electrical Engineering and Computer Science; the Energy Units for Utilisation of Non-Traditional Energy Sources, the Institute of Clean Technologies for Mining and Utilisation of Raw Materials for Energy Use, Innovation for Efficiency and the Environment, and the Institute of Environmental Technologies, the Institute of Geonics of the ASCR.
3. Business intelligence (especially ERP), e-commerce - a new software architecture for the development of intelligent management (ERP) and CRM software. The implementer is VŠB - the Faculty of Electrical Engineering and Computer Science (in cooperation with the IT Cluster).
4. Software for crisis management, integrated security systems - for the prediction and subsequent elimination of natural disasters (floods - erosion, fires, etc.), industrial accidents, including an analysis of impacts on human health and the environment, security of critical infrastructure elements. The implementer of these research directions is VŠB-TUO, the Faculty of Safety Engineering (in cooperation with the Safety & Security Technology Cluster and IT Cluster).
5. Research in the field of advanced therapy products (platelets, stem cells), vascular diseases and regenerative medicine (stem cells), the subsequent statistical and data analyses of the impacts and success of the treatment methods for patients (bioinformatics, biostatistics), related personalised medicine. The implementers of these research activities are - the Ostrava University Hospital, the University of Ostrava - the Faculty of Medicine, the Ostrava Health Institute, VŠB-TUO - the Faculty of Electrical Engineering and Computer Science, IT4I.
6. Machine technology (for processing stainless steels and alloys), the technology of production of precision machine parts from these materials (for the automotive industry and energy, or for medical devices). The implementers of these research directions are VŠB-TUO - the Faculty of Mechanical Engineering and the Faculty of Electrical Engineering and Computer Science.
7. Electrical mobility and the related infrastructure - the development of electric vehicle platforms (for light freight transport in urban areas), development of batteries, ultra-capacitors and recovery systems, development of fast charging stations for electric cars (including contactless charging). The implementers of these research directions are VŠB-TUO - the Faculty of Mechanical Engineering and the Faculty of Electrical Engineering and Computer Science, and the Moravian Research.

For these research areas, the supercomputing methods of modelling and simulation at the IT4Innovations Computer Centre of Excellence at VŠB-TUO can be used.

At VŠB-TUO, there are Competence Centres supported by the TA CR programme of the same title that address other specific research areas beyond the above or in concurrence with the above. Below are described the two main competence centres with VŠB-TUO as the main implementer.

The first is the Transport Systems Development Centre (RODOS) that establishes strategic partnerships between the collaborating research institutions and companies defining the direction of development of smart mobility in the Czech Republic. The mission of this partnership is finding a balance between the need for movement of modern society and the negative effects of mobility. The total value of the project is CZK 211.8 million, the duration of implementation is 6 years (2012-2018). In addition to VŠB-TUO (IT4Innovations), the partners include KVADOS, a.s., Kapsch Telematic Services spol. s r.o., ELTODO dopravní systémy s.r.o., Transport Research Centre, public research institution, and others.

The second is the Competence Centre for Effective and Ecological Mining of Minerals and its objective is to contribute to energy independence and security of the Czech Republic. This objective is supposed to be

achieved through the development of advanced technologies to guarantee a cost-effective extraction of high-quality mineral resources while minimising the environmental impacts associated with mining. In addition to VŠB-TUO (the Faculty of Mining and Geology), the partners include the Czech Geological Survey, DIAMO, state enterprise, Watrad spol. s r.o., RPS Ostrava a.s., and Sedlecký kaolin a. s. It is a recently approved project with the period of implementation of 2014 - 2019 and a total value of CZK 155 million.

In the Moravia-Silesia Region, there is a wide portfolio of cluster organisations most of which have long been involved in research, development and innovation activities. The following paragraphs describe the support cluster organisations in the Moravia-Silesia Region, including the specification of their research, development and innovation activities.

Czech Machinery Cluster

The cluster currently has 66 members mainly from the field of heavy mechanical engineering and energy. The cluster implements sub-activities and projects to support its members in research, development and innovation, education, the development of supplier-customer relations, export activities and related cluster member promotion. In terms of research, development and innovation, the cluster, through its members, focuses in particular on:

- Nuclear (and conventional) energy - part of the primary circuit (technology modules for power facilities);
- Technology in the context of the use of compressed gas;
- Secondary - waste utilisation technologies for combined production of electricity and heat (pyrolysis technology).

The activities described above bring benefits mainly to small and medium-sized businesses which are closely involved in the supply chains of large companies (leaders) in the cluster - Vítkovice, a. s., ŽĎAS, a. s. and Strojírny a stavby Třinec, a.s. The cluster helps small and medium-sized enterprises to jointly implement the above-described activities (projects) that they cannot afford by themselves for financial and capacity reasons.

Moravian-Silesian Automotive Cluster

The Moravian-Silesian Automotive Cluster was founded in 2006 and currently has 60 members. The cluster is heavily focused on the area of research, development and innovation projects. In addition to this area, it is also involved in education, joint purchase, exchange of expertise and international cooperation. The main research directions of the cluster are:

- Plastics;
- High-strength materials;
- Moulds, tools and implements (metal powder injection technology);
- Ergonomics;
- Energy recovery and storage in cars.

The benefits of the activities in the cluster can be seen mainly in the construction of a unique research infrastructure at VŠB-TUO (noise, heat, pulsation laboratory, etc.) to meet the needs of the cluster members, especially among small and medium-sized businesses that thus have access to cutting-edge technological equipment which would otherwise be unavailable to them, and thus enabling them to continuously improve their competitiveness in international customer-supplier relationships.

Moravian-Silesian Wood Processing Cluster

The Moravian-Silesian Wood Processing Cluster was founded in 2005 and has 28 members. The main area of interest is the development and promotion of wooden buildings mainly for residential purposes, but also in infrastructure. Following this, the cluster develops related activities in the field of education, joint purchase and trade cooperation. In the area of research and development, the cluster is engaged in the following fields:

- Wooden materials (testing and measurement of performance);
- Construction of wooden objects (including multi-story buildings).

The described activities bring benefits primarily to the cluster members; in terms of development of the region as a whole, it is a sector that is complementary to the main sectoral profile of the region.

Moravian-Silesian Energy Cluster

The cluster was founded in 2008, has 21 members, and associates entities operating in the energy and especially in the heating industry. Its activities can be divided into research and development, promotion of the cluster members and education and increasing the energy literacy of citizens. In the area of research and development, the cluster is engaged in the following fields:

- Energy savings and energy efficiency improvements in conventional energy sources (coal, natural gas) during the production, use and storage of energy, including heating;
- Secondly, alternative and renewable sources of energy (e.g. solar energy).

The cluster represents one of the key sectors of the region and is involved in the preparation of the Energy Concept of the Moravia-Silesia Region. Its significance for improving the efficiency and competitiveness of conventional energy (processing of coal for electricity and heat generation, natural gas heating and its use in manufacturing processes) in the Moravia-Silesia Region is indisputable.

IT Cluster

The IT Cluster was founded in 2006 and currently has 39 members. The cluster focuses on the preparation and implementation of joint projects of its members in research and development, education, marketing and business cooperation. An important impetus for further development of the cluster and its members is the establishment of the Computer Centre of Excellence (IT4Innovations) at VŠB-TUO. In the area of research and development, the cluster is engaged in the following fields:

- Mobile technology (e.g. the provision of field health and social care, multi-platform solutions);
- Business intelligence, e-commerce;
- Multidimensional on-line data structures and libraries in health care and emergency systems;
- Special software systems for crisis management.

The cluster provides its members (small and medium-sized companies) with synergistic advantage over multinational IT corporations consisting in common solutions to major business cases. Another benefit of the cluster for small and medium-sized businesses lies in the facilities of VŠB-TUO, the Faculty of Electrical Engineering and Computer Science, both in terms of cooperation on research projects (including the above-mentioned newly opened IT4Innovations centre) and in terms of the possibility of obtaining qualified graduates meeting the requirements of companies due to their close cooperation with the university.

Envicrack

This cluster is an example of a specialised research cluster in the field of renewable energy and related technologies. It was founded in 2005 and currently has 28 members. In addition to activities in the field of applied research, the cluster promotes business cooperation and joint marketing of its members. Regarding research activities, the cluster is focused on:

- Renewable energy - pyrolysis technology;
- Rail transport (reducing transport energy intensity - battery locomotives);
- Supporting performance storage systems (electrical mobility - charging stations, solar energy);
- Smart modes (intelligent energy networks).

This cluster concentrates unique know-how in the field of co-generation of electricity and heat (co-generation - pyrolysis), which is significant for this region due to the wide possibilities of energy recovery from waste and other substances from industrial production and old environmental burdens.

Safety & Security Technology Cluster

The Safety & Security Technology Cluster was founded in 2010 and currently has 32 members. Its main activities include research projects in the field of industrial safety, with related education and promotion of the cluster members. The research activities of the cluster include:

- Systems and devices for mobile measurement;
- Methods of assessment of mental (physical) stress at work;
- Risks of industrial processes with the danger of explosive atmosphere;
- Systems of integration of security technologies;
- Safety locks;
- Technical and information support of KI/EKI protection.

Due to the high concentration of heavy industry in the region and the associated dangers of serious industrial accidents and damage to human health, the above-described activities of the cluster (safety technology in industry) have high benefits for the region, not only in relation to its sectoral profile, but also in relation to the export potential of these security solutions.

Companies

To map the potential areas of research specialisation, a field survey of a sample of companies representing five key sectors in the Moravia-Silesia Region (metallurgy - mechanical engineering, automotive, IT and electrical engineering, energy and biotechnology) was carried out. Based on the results of the field survey, a study on the value chains in the Moravia-Silesia Region was prepared. The following paragraphs provide key innovation companies in the individual key sectors (in terms of their areas of research):

- **Metallurgy - Mechanical Engineering:** TŘINECKÉ ŽELEZÁRNY, a. s., MATERIÁLOVÝ A METALURGICKÝ VÝZKUM s.r.o., VÚHŽ, a. s., VÍTKOVICE MACHINERY GROUP, ArcelorMittal Ostrava, a. s., Bonatrans, a. s., Strojferr, s. r. o., V-Nass, a. s., Elfe, s. r. o.
- **Automotive:** Varroc Lighting Systems, s. r. o., Brano Group, a. s., Continental Automotive Systems, s. r. o., Komax, s. r. o., Cromodora Czech, s. r. o.,
- **IT + electro:** K2 atmitec, s. r. o., NetDirect, a. s., Kvados, a. s., Elcom, a. s., Tieto Czech, s. r. o., D3 Soft, s. r. o., Dodávky automatizace, a. s., IngeTeam, a. s.
- **Energy:** Dalkia ČR, a. s., Dodávky automatizace, a. s., Elcom, a. s., Agro-Eko, s. r. o., Arrow Line, s. r. o.
- **Biotechnology:** The Ostrava University Hospital, 4MEDI Biotechnology Park, CBTD, a. s., Primecell, a. s., Teva Pharmaceuticals, s. r. o., Mölnlycke Healthcare, s. r. o.
- **Waste treatment:** TŘINECKÉ ŽELEZÁRNY, a. s., VÚHŽ, a. s., Vítkovice, a. s., Arrow Line, s. r. o., Agro-Eko, s. r. o.

Innovation infrastructure facilities

Regional Development Agency

The Regional Development Agency is the main author of the Regional Innovation Strategy of the Moravia-Silesia Region 2010 - 2020 (prepared in a broad partnership of the academic, corporate and public sectors) and is responsible for its implementation. Specifically, the RDA is in charge of the following:

- Organisation of meetings and preparation of the factual content of the Innovation Council of the Moravia-Silesia Region as a senior authority for defining development trends and innovation strategy management;
- Organisation of meetings and preparation of the factual content of strategy teams (currently the ClusterNet and Start-ups platforms);

- Ensuring the preparation, completion and subsequent evaluation of the RIS implementation action plans with specific projects guaranteed by the individual actors of the regional innovation system;
- Guaranteeing the implementation of selected projects of innovation strategy to promote technology transfer (proposal of appropriate support financial instruments for the Moravia-Silesia Region), education (educational seminars in innovation management, projects of promoting technical fields among pupils in elementary schools), internationalisation (brokerage events, participation in international projects), organisation of the Innovation Company of the Moravia-Silesia Region Competition, etc;
- Marketing of innovation activities in the Moravia-Silesia Region - promotion of the results of innovation activities of companies, universities, research institutes, cluster organisations and individual personalities from the region in terms of innovation in order to raise awareness about these activities and motivate other stakeholders to actively engage in these activities.

Regional Chamber of Commerce of the Moravia-Silesia Region

The Chamber serves to support entrepreneurial activities and to promote and protect the interests of its members. Within its scope of competence, it provides advisory and consulting services in matters related to business activities, organises educational activities, information services about professional training and retraining forms, and establishes and develops contacts with chambers of commerce and specialised institutions abroad.

Innovation Support Centre

The Innovation Support Centre (ISC) is a facility under the VŠB - Technical University of Ostrava whose activity is focused on the following areas:

- The involvement of the university in the implementation of high-quality educational, scientific and research projects, especially those financed from European grants. The ISC seeks grant opportunities, participates in the preparation and implementation of projects and coordinates their effective management;
- The support for commercialisation of selected know-how of the university, especially through the exercise of intellectual property rights and the support of activities in the field of innovative business. The ISC operates the VŠB-TUO Business Incubator;
- Coordination of the support for the popularisation of science and research for the benefit of VŠB-TUO (the ISC implements projects in the popularisation of science and technology).

The key activities of the ISC in the field of support for business and technology transfer include:

Business support:

Green Light Start-up Accelerator - a competition for the best business plan, which also includes an intensive training course aimed at accelerating the transformation of the business plan into a growing business; Business Incubator Services (including favourable rent); Motivational Apple Juice Meetings and other events; linking the university with the world of business and finance.

Technology transfer:

Help in deciding on the form of application of innovation in the market (the use of the results of applied R&D at VŠB); support in the implementation of the chosen path of commercialisation; ensuring IPP, legal services; facilitating the cooperation with research institutes of VŠB-TUO; training of researchers in the field of industrial and legal protection.

Ostrava Science and Technology Park

STP Ostrava is a facility that in cooperation with universities and science and research institutions coordinates scientific and technological research and the transfer of advanced technologies from these institutions to companies based in the STP (start-ups or companies entering the phase of development). It provides space for commercially-oriented scientific and technological research, industrial mastering of research, product

innovation and business development. Within the park, there is the IDEA Incubator to support new innovation intentions and the Technology Incubator focused on supporting existing businesses. Both incubators offer favourable renting of the park area and discounted consultancy services.

Steel IT Business Incubator

The Steel IT Business Incubator focuses on information and communication technologies and the so-called knowledge and new economy. The aim of the BI is to facilitate the transfer of new ideas and knowledge in the field of ICT into practice and to create adequate conditions for starting a business in this area. The incubator aims its support mainly at recent graduates and start-ups and young entrepreneurs in ICT, to whom it offers discounted rental space and counselling. In the first stage, the BI offers the programme of the so-called “Pre-incubation” - this is the incubator of “ideas”, help and support for creative people who intend to bring something new to the market, such as a new technology, know-how, etc.

Ostrava Business Innovation Centre

BIC Ostrava is one of the oldest business incubators in the Czech Republic. The main activities of BIC Ostrava include support to entrepreneurs focused on industrial production, the promotion of international technology transfer and the promotion of international cooperation in research, the provision of services in its own research centre on industrial applications focused on hydraulics, pneumatics and mechatronics, and of course also counselling for innovation start-ups.

Business Incubator of the Ostrava Business School

The BI of the Ostrava Business School focuses on information technology and related services. The goal of the BI is to support new entrepreneurs through the provision of space and services on preferential terms (preparing a business plan, coaching in the establishment of the company, business financing, etc.), especially among the Business School students, but also external applicants.

Public administration

Moravia-Silesia Region

In the long term, the Moravia-Silesia Region is systematically engaged in supporting research, development and innovation activities. The existing Regional Innovation Strategy of the Moravia-Silesia Region 2010-2020 includes a relatively wide range of grants to support innovation processes at universities and in research institutes, companies and cluster organisations. The specific grant programmes/schemes are listed above.

Statutory City of Ostrava

The Statutory City of Ostrava creates and regulates the conditions for the economic development of the city, which is the centre of R&D activities in the region. The specific financial instrument of the city to support innovative business is the Microloan Fund implemented together with the Moravia-Silesia Region as the first outcome of the implementation of the competitiveness strategy of the City of Ostrava.

1.5 SWOT analysis

Strengths and weaknesses

Strengths	Weaknesses
<i>Position of the region</i>	
Unique knowledge and competences concentrated in traditional sectors (the value chain of “carbon-steel-machinery”) with potential applications in new fields (advanced materials, mechatronics and robotics, environmental technology, energy savings, etc.).	The continued fragmentation of the regional innovation system - a large number of “players” in all dimensions of the triple helix, parallelism and duplication of RDI activities.
A high export performance and thus a strong connection of the economy of the Moravia-Silesia Region to global value chains especially in the automotive industry, mechanical engineering, energy and IT.	A lower level of public expenditure on R&D as a share in GDP.
A strong concentration of FDI, even in sectors with a higher added value of production.	Continued selective migration - the outflow of skilled people to other regions.
The dominant position of the region in the development of cluster initiatives.	Poor image of the region as a result of adverse environmental conditions and old ecological burdens (often inadequately presented by the media).
The strategic location of the region (Czech Republic-Slovak Republic-Poland).	Insufficient air and road connections (no highway on the route Opava - Žilina).
<i>Innovative business</i>	
The existence of key “players - leaders” on the part of the private and academic sectors.	Low willingness to pursue innovative business, few innovation SMEs, including a low-intensity formation of new start-ups and spin-offs.
The existence of advanced technology SMEs.	
<i>R&D</i>	
The close links between the sectoral and research specialisation of companies and the research orientation of regional universities and research institutes.	The untapped potential of cooperation in contractual and applied research between universities, research institutes and companies (due to a lack of motivation of researchers and insufficient R&D service offer by knowledge institutions, “in-house” research of large companies and limited innovation activity of SMEs).
High R&D expenditure in the business sector as a share in GDP mainly due to the presence of large companies - Czech and foreign.	A less intense involvement of the MSR entities in international research cooperation (participation in the 7th FP etc.), a “passive receipt of signals from abroad” and the related low or late awareness of international technological trends (with the

	exception of large enterprises).
The presence of the large VŠB (technical university) with a high potential for applied research and a newly built research infrastructure (research centres supported by the OP RDI, including a supercomputing centre of excellence, IT4Innovations).	
<i>Human resources for innovation and R&D</i>	
Existing teams of researchers in research organisations with close ties to the local industry.	A low level of non-technical R&D skills and conservative managers of small and medium-sized companies (less ability to receive market signals and transform them into internal processes).
	The lack of linguistically and technically educated labour force at the secondary school and university level including a shortage of skilled labour in R&D (particularly for the needs of the new research centres at VŠB-TUO).



Opportunities and threats

Opportunities	Threats
<i>Political/legislative influences</i>	
Continued support for RDI activities by the political representation of the region.	The increasing fragmentation of support for R&D activities and the management of R&D activities in the Czech Republic.
<i>Economic/financial impacts</i>	
The growth of FDI in RDI activities of foreign companies operating in the region.	The ongoing negative propaganda of the image of the region with the subsequent negative impact on the development of FDI.
New OP to support RDI for the period 2014-2020 (OP EIC, OP RDE) - for the funding of key research projects in the region including the emergence of new financial schemes to support the solutions to the specific needs of the region's innovation system.	The growing problems of the regional coal and metallurgical industries which may consequently negatively affect the social and economic situation in the region, including possible restrictions of certain RDI activities in some, especially Czech, companies.
	The continued fragmentation of the innovation system, the difficulties in finding common themes among the main actors, limited willingness to cooperate.
<i>Social/demographic influences</i>	
The possibility of obtaining new foreign researchers and Ph.D. students for the needs of the OP RDI research centres.	The continued migration of qualified people.
The motivation of young R&D staff and Ph.D. students to use knowledge and skills in the new R&D infrastructure of the region.	Deepening the lack of technical labour force including a shortage of skilled labour in R&D.
<i>Technological aspects</i>	
The potential for a significant increase in applied research, experimental development and contractual research within the defined directions of research specialisation, whose outputs have a cross-cutting impact on a wide range of manufacturing industries and the energy sector (e.g. advanced materials, low-cost automation, etc.).	The untapped potential of applied research at research centres supported by the OP RDI and the 4MEDI biotechnology park.
Interesting possibilities for interdisciplinary and cross-sectoral research - a combination of technologies from different sectors (e.g. mechanical engineering - environmental technology, IT -	Intensive technological development of selected "low-cost" countries threatening the position of large companies based in the region in international

automotive, IT - energy, mechanical engineering - nanotechnology, biotechnology - nanotechnology, IT - biotechnology, IT - security technology).	supply chains.
Effective use of research centres supported by the OP RDI - for applied and contractual research in the regional and transregional dimension.	Insufficient innovation performance of institutions and low use of the creative potential of the region.
The opportunity of a wider participation in international research cooperation, in particular through the effective use of new community programmes of the Commission (Horizon 2020, Cosme, Eureka, etc.).	
The newly built 4MEDI biotechnology park with the latest technological equipment in Europe - for stem cell research with tremendous application potential.	

1.6 Methodology of preparation of the regional annex

For the preparation of the regional annex, the existing RIS of the Moravia-Silesia Region 2010-2020, which is an appropriate basis, was used. Adjustment was made in accordance with the Guide of the European Commission for Research and Innovation Strategies of Smart Specialisation and on the basis of the results of the analysis of the innovation system of the Moravia-Silesia Region, which consists of the following parts - analytical documents:

- Study of value chains in the Moravia-Silesia Region - this is an analysis of the current and expected future state of the five key sectors in the region (metallurgy - mechanical engineering, automotive, IT and electrical engineering, energy and biotechnology) in production and research activities, supplier-customer relations and export potential in order to identify possible areas of research specialisation preferred by the private sector for inclusion in the RIS3 of the Moravia-Silesia Region 2014-2020.
- Study of research and innovation activities of knowledge institutions and cluster organisations - this document covers the key research activities of those institutions which have the potential for applications in the private sector and are thus suitable for possible inclusion in the RIS3 of the Moravia-Silesia Region 2014-2020.
- Study of intermediary institutions for the support of innovation - this study summarises the activities of the public sector and other public organisations (the Regional Authority of the Moravia-Silesia Region, the Regional Development Agency, the Statutory City of Ostrava, the Regional Chamber of Commerce of the Moravia-Silesia Region, the Union for the Development of the Moravia-Silesia Region, business incubators etc.) that are supposed to create conditions favourable for the preparation and implementation of innovation processes.
- Statistical analysis of the innovation performance of the Moravia-Silesia Region - this document serves to compare the Moravia-Silesia Region and the other regions of the Czech Republic and selected foreign reference regions in specific statistical indicators to determine the position of the region in the national and international context.

After the conducting of the above partial analytic studies, a SWOT analysis was carried out that summarises all the key findings in these studies. The SWOT analysis was then used as the basis for the so-called problem analysis (problem tree), which in a logical sequence of cause-problem-consequence describes all relevant causalities in the innovation system of the Moravia-Silesia Region identified in the analytical studies. The

problem tree was used to modify the proposal part (horizontal priority areas). The information from the analytical studies was used for sectoral workshops whose aim was to define potential areas of research specialisation of RIS3 of the Moravia-Silesia Region 2014-2020.

For the preparation of the analytical and proposal parts of the annex and RIS3 of the Moravia-Silesia Region, a working group was established, consisting of the RDA team and selected members of the Innovation Council of the Moravia-Silesia Region.

The above studies are available at: <http://www.rismk.cz/cz/ke-stazeni/21-inovacni-strategie/> (in section Materials related to RIS3 2014-2020). The above studies are part of the annexes to the RIS3 of the Moravia-Silesia Region 2014-2020.

S
RIS
S
RIS
S
RIS
S
RIS

2. Proposal Part

2.1 Vision

The vision set out below is based on the analysis of the innovation system of the Moravia-Silesia Region and at the same time takes into account future development opportunities of traditional and new promising sectors and the related issues of technology transfer, innovation infrastructure, human resources and international cooperation. On the basis of these aspects, the vision of RIS 3 of the Moravia-Silesia Region for the years 2014 - 2020 is set out as follows:

Use and further develop the existing unique know-how in both traditional and new promising sectors for new opportunities given by the international technological trends and rank among the 40 most innovative regions in Central Europe by 2020.

To this end, emphasis will be placed on optimising processes in technology transfer, the effective use of the existing research infrastructure, strengthening and increasing the qualification of human resources in research and development, international research cooperation and, last but not least, the interdisciplinary research, both in knowledge institutions and in companies.

2.2 Global objective

The global objective of the RIS of the Moravia-Silesia Region for the years 2014 - 2020 is based on the vision formulated above, and is the expression of its fulfilment. In line with the content of the vision, the global objective is defined as follows:

Increase the competitiveness of the economy of the Moravia-Silesia Region in global markets.

Objective fulfilment indicator:

Gross value added per employee in the Moravia-Silesia Region/gross value added per employee in the Czech Republic - 110 % of the national average by 2020.

2.3 Key Change Areas

Based on the results of the SWOT analysis, problem analysis, based on direct demand of entities in the innovation system for specific support tools, and based on the discussion in the Innovation Council, the topicality of the horizontal priority areas of the existing RIS of the Moravia-Silesia Region, which are also applied in the RIS 3 of the Moravia-Silesia Region 2014-2020, was confirmed.

These horizontal priority areas are further divided into strategic objectives (one for each horizontal priority area - this shows the projected future state to achieve

through individual interventions in the horizontal priority area) and specific objectives that are supposed to use their interventions (activities/projects) to synergistically fulfil the strategic objectives.

2.3.1 Key change area A: TECHNOLOGY TRANSFER

Horizontal Priority Area A - TECHNOLOGY TRANSFER is designed to solve the key problem typical not only of the Moravia-Silesia Region: increasing the applicability of the R&D results of research organisations in the private sector and creating optimal conditions for this purpose. This priority area is focused on enhancing the transfer and commercialisation of results of the research and development activities from knowledge institutions to companies on the one hand and on supporting the implementation of contractual research in knowledge institutions/research organisations on the other (stimulating the demand of companies for research capacities of knowledge institutions). The result of systemic cooperation will be collaborative research projects with the active participation of both parties. Given that the Moravia-Silesia Region is one of the regions in the Czech Republic with the lowest level of entrepreneurial activity in the sector of small and medium-sized businesses, this priority area includes the support for the establishment of new spin-offs and innovation start-ups, including the introduction of new financial instruments for this target group of companies. The object of attention is also the support for interdisciplinary research that is crucial to creating breakthrough innovation, and for which there are many opportunities in the Moravia-Silesia Region. The private sector will play an important role in terms of the acquisition of investments in research and development capacities of foreign as well as domestic investors.

Key change area A: TECHNOLOGY TRANSFER		
Strategic objective in Horizontal Priority Area A: Increasing the intensity of innovation activities of companies using their own capacities and at the same time of the R&D results of research organisations.		Indicator of the strategic objective: Non-capital R&D expenditure in the business sector - an increase by 30 % by 2020 (compared to 2014).
Description of the strategic objective: <i>The essence of the strategic objective is to increase the number of new innovation products marketed by companies from the Moravia-Silesia Region, i.e. strengthen the implementation of innovation processes of higher order in companies ("in-house" R&D), and on the basis of their cooperation with research organisations (universities, research institutes) or with other companies on interdisciplinary basis or along the supply chain. To achieve this goal, the specific sub-objectives include interventions of various types (systemic, financial, networking) to optimise sub-systems of technology transfer in the individual entities of the innovation system.</i>		
Specific objectives	Specific objective indicator	Typical activities / projects / operations
Specific Objective A1 - Increase the intensity of the transfer and commercialisation of results of the research and development activities	<i>Number of research result licences provided by research</i>	Support for science and research in the Moravia-Silesia Region - grant scheme for the support of R&D projects of research organisations. Summer schools - ROs + the application sphere.

<p><i>Activities under this objective are intended to optimise and streamline conditions at universities and research institutions to transfer their research and development results to the business sector (including the application of IPP tools). This objective includes direct support of applied research and experimental development in these organisations, based on the identified future needs of the business sector (using foresight analyses - see Specific Objective C2).</i></p>	<p><i>organisations to companies - an increase of 50 % by 2020 compared to the default value in 2014.</i></p> <p><i>Sales of licensed intellectual property of research organisations in the Moravia-Silesia Region - an increase of 100 % by 2020 compared to the default value in 2014.</i></p>	<p><i>Support for the preparation of projects implementing the SO (through the smart accelerator).</i></p>
--	---	--



<p>Specific Objective A2 - Increasing the volume of contractual and collaborative research in research organisations</p> <p><i>For this specific objective, the aim is to motivate companies to assign specific research and development tasks to universities and research institutes for their needs (the so-called contractual research) or to actively participate in the implementation of research and development projects together with research organisations (the so-called collaborative research). An integral part of this objective is also the stimulation of research organisations in their offer of research capacities to companies. This is of course related to promotional activity on the part of universities towards companies, in particular in relation to new research centres supported by the Operational Programme Research and Development for Innovations. These research centres represent a new opportunity for significant strengthening of the share of contractual and collaborative research in research organisations in the Moravia-Silesia Region. The projects are as follows:</i></p> <ul style="list-style-type: none"> - IT4Innovations Centre of Excellence, - Institute for Clean Technologies in Extraction and Utilisation of Energy Resources (ICT), - Energy units for the use of unconventional energy sources (ENET), - Innovation for Efficiency and the Environment (INEF), - Institute of Environmental Technology (IET), - Regional Material Technology Research Centre (RMTVC). 	<p><i>The volume of contractual research for the private sector at universities in the Moravia-Silesia Region (VŠB: CZK 100 million in 2020, the University of Ostrava: CZK 40 million in 2020).</i></p> <p><i>The share of contractual research for the private sector in the operating budgets of universities in the Moravia-Silesia Region (VŠB: 4 % in 2020, the University of Ostrava: 5 % in 2020).</i></p> <p><i>The financial volume of collaborative research projects: CZK 400 million by 2020</i></p>	<p>Programme for the support of cooperation between ROs and companies (innovation vouchers, support for collaborative research).</p> <p>Compensation Fund.</p> <p>Visits to research centres by companies.</p> <p><i>Support for the preparation of projects implementing the SO (through the smart accelerator).</i></p>
<p>Specific Objective A3 - Increasing the number of established spin-offs and innovation start-ups</p> <p><i>This objective is mainly concerned with providing professional consulting services to starting innovation small and medium-sized</i></p>	<p><i>The number of companies that have undergone incubation and are still active 3</i></p>	<p>Programme of innovation ambassadors/mentors.</p> <p>Microloan Fund.</p> <p>Prototype workshop (idea lab).</p>

<p><i>enterprises and entrepreneurs (during the stage before or after establishment) in terms of their business plans (using the methods of Proof of Concept, Proof of Relevance and an assessment of the potential application of IPP tools), including providing the necessary financial support and technical assistance. This specific objective also includes support for proposed research at an early stage with the potential of the use of the results in the form of newly established innovation companies (the so-called pre-seed activities). Regarding the aforementioned financial support, the purpose of this specific objective will also be to identify, pilot test and then implement new financial instruments of the repayable type of quasi-loans, quasi-equity or equity (venture capital - seed funds, venture capital funds, etc.) as alternatives to the standard grant schemes (in the programming period 2014-2020 the share of such financial instruments will increase). The target groups of these financial instruments are mainly starting small and medium-sized businesses and entrepreneurs, universities and research institutes.</i></p>	<p><i>years after their establishment - 25 companies by 2020</i></p> <p><i>The number of fast-growing companies (gazelles) of the total number of companies that have undergone incubation - 30 % by 2020 (see above).</i></p> <p><i>The proportion of university graduates commencing business/pursuing business activities of the total number of graduates (to be calculated as of the 2nd anniversary of graduation) - 15 % by 2020.</i></p> <p><i>Number of new introduced financial instruments of the repayable type - 1 new by 2020.</i></p>	<p>Green Light (competition for the best student business plan)</p> <p><i>Support for the preparation of projects implementing the SO (through the smart accelerator).</i></p>
<p>Specific Objective A4 - Increasing the number of interdisciplinary research activities</p> <p><i>Interdisciplinary research is one of the main tools for the generation of new breakthrough technologies and possibly new markets, and can thus contribute to the emergence of new promising research fields. There are many opportunities for this type of research in the Moravia-Silesia Region, both in the areas of research specialisation and in the broader context among the key sectors in the Moravia-Silesia Region (metallurgy - mechanical engineering, automotive, IT and electrical engineering, energy and</i></p>	<p><i>Number of identified interdisciplinary research projects: 30 by 2020.</i></p> <p><i>Number of implemented interdisciplinary research projects: 12 by 2020.</i></p>	<p>Analytical and consulting activities (in areas of research specialisation and supporting sectors - using the results of technology foresight - see Specific Objective C2).</p> <p>Networking and facilitation activities (following the analytical activities) - identification of suitable partners, raising funds, etc.</p> <p>The above activities will take place in the context of the innovation platform for the support of clusters (ClusterNet).</p>

<p><i>biotechnology). This objective will aim at pursuing activities to identify potential interdisciplinary research projects and at the subsequent provision of the conditions for their implementation (financial resources, human and technical capacity).</i></p>		<p>Programme for the support of cooperation between research organisations and companies (support for collaborative research).</p> <p><i>Support for the preparation of projects implementing the SO (through the smart accelerator).</i></p>
<p>Strategies and regional documents that are used as a basis for specific objectives:</p> <p>The Regional Innovation Strategy of the Moravia-Silesia Region 2010 - 2020: the default document that is amended to the RIS3 of the Moravia-Silesia Region for 2014-2020.</p>		
<p>Conditions for and barriers to the implementation of interventions in the key change area:</p> <ul style="list-style-type: none"> - Streamlining the processes of technology transfer in research organisations, increasing their flexibility towards the requirements of the private sector. - The motivation of the corporate sector to collaborate with research organisations on a long-term and systematic basis including the formulation of specific needs for solutions demanded from research organisations. - Mental attitude of the people in the Moravia-Silesia Region to innovative business (a prevalent tendency to work in an employment relationship). - The use of the opportunities to prepare and implement interdisciplinary research projects by companies and research organisations in the Moravia-Silesia Region. - The predominance of subsidy programmes in the next programming period of the EU for 2014-2020 inducing a lower interest in financial instruments of the repayable type. - The scarcity of sites for industrial production, low attractiveness of the environmental image of the region. 		

2.3.2 Key change area B: HUMAN RESOURCES

Horizontal Priority Area B - HUMAN RESOURCES focuses on achieving the key objective which is to increase the knowledge and skills of researchers in knowledge institutions and companies both in the conceptual RDI topics and in specific areas of expertise in research and development. Specifically, the sub-activities in this area respond to the identified needs of increasing the professional competences of human resources in terms of the knowledge economy (e.g. in the area of technology transfer, IPP, methods of innovation management, technology foresight, etc. - a suitable target group may also be executives of companies and knowledge institutions). What is also very important is increasing the professional qualification of human resources in knowledge institutions through incentive systems and developing other skills necessary for a high-quality preparation and management of collaborative research projects with other knowledge institutions, but especially with businesses (marketing, language, managerial and communication skills). On the other hand, it is necessary to further develop the skills of researchers in companies in their areas of research specialisation for the implementation of more complex research tasks in the case of which there may be the need for cooperation with knowledge institutions. As in the case of researchers in knowledge institutions, researchers in companies also need to develop soft skills to increase the effectiveness of the communication processes between the two parties. The key is also to attract top and other qualified researchers from abroad for the purposes of research centres supported by the OP RDI and companies based in the Moravia-Silesia Region. To ensure a sufficient amount of R&D workers with the necessary knowledge and skills, it is necessary to systemically support education in technical secondary schools and universities and continuously identify and develop technical talent. This will support companies in creating new jobs in technical professions, which will be one of the indirect effects of the implementation of specific objectives in this horizontal priority area.

Key change area B: HUMAN RESOURCES		
Strategic objective in Horizontal Priority Area B: Improvement of technical and non-technical skills of researchers in knowledge institutions and companies for the needs of applied research and experimental development.	Indicator of the strategic objective: The proportional involvement in projects of applied research and experimental development for the needs of the corporate sector per one researcher of a research organisation - achieving twice the present value (2014) by 2020.	
Description of the strategic objective: The objective aims to comprehensively improve the level of expertise and skills of researchers in knowledge institutions that are relevant to the application in applied research and experimental development, whether implemented by knowledge institutions within their defined spheres of research activities or on the basis of direct demand by private companies. The supply of qualified researchers by knowledge institutions is one of the key prerequisites for the development of cooperation between knowledge institutions and companies and the increase in the innovation performance of the Moravia-Silesia Region as such. At the same time, attention will be focused on the professional development of researchers in companies focused on the research activities of a wider dimension, where there is a real need for cooperation with knowledge institutions. To ensure a sufficient supply of qualified researchers, it is necessary to primarily support the increase in the number of graduates of technical fields, for example by means of targeted campaigns and specific actions for promoting technical studies while using the system measures enabling students to take part in internships in companies, regulating technical study programmes according to the needs of employers and finally identifying and developing technical talent in elementary and secondary school students. The targeted promotion of technical education and popularisation of technical studies will lead to an increase in the supply of technically oriented applicants in the labour market, encouraging the creation of new jobs due to the scarcity of employees in technical professions in companies.		
Specific objectives	Specific objective indicator	Typical activities / projects / operations
Specific Objective B1 - Increasing the professional competences of human resources in the field of knowledge economy <i>This objective emphasises the increase in the awareness of managers of small and medium-sized companies, cluster organisations and business incubators on issues of research, development and innovation. The content of the specific objective will be specific educational activities in this area (innovation management, open innovation, technology transfer, IPP, technology foresight, social innovation, etc.). In addition to the educational activities of this type, the objective will include specific training of technical staff in their core technical competences and education in the field of strategic management (entering foreign markets or new market segments etc.).</i>	<i>Number of training events - 30 events by 2020. Number of participants trained - 300 by 2020.</i>	<i>Educational projects - in the field of IPP, etc. (national horizontal calls). Support for the preparation of projects implementing the SO (through the smart accelerator).</i>
Specific Objective B2 - Increasing the professional qualification and other skills of human resources in research and development	<i>The number of researchers and skilled service staff at universities and in research</i>	<i>Programme for R&D jobs in companies. Programme of support for science and research - scholarships for Ph.D. students and extra bonuses for doctoral</i>

<p><i>This specific objective includes the support for the development of professional skills of researchers at universities and in research institutes (including Ph.D. students and qualified service personnel working with technical equipment) in their specialisations, including the development of further competences, i.e. soft (communication, managerial) and hard (language, marketing) skills that are necessary for the proper preparation and management of research projects and effective collaboration with the business sector. This specific objective will also include internships of Ph.D. students and talented students in the Master's programmes and their participation in research and development projects in companies. At the same time, the content of this objective will be to support the development of professional skills of researchers in companies with a focus on long-term research activities that may be the subject of cooperation with knowledge institutions.</i></p>	<p><i>institutes and Ph.D. students involved in projects of applied research and experimental development - 450 by 2020. The number of researchers in companies and research institutes and at universities and Ph.D. Students participating in educational projects for the development of soft and hard skills: 500 by 2020.</i></p> <p><i>Number of Ph.D. students and talented students in the Master's programmes participating in internships in R&D projects in companies: 70 by 2020.</i></p>	<p>graduates.</p> <p>Programme of support for student internships in companies.</p> <p><i>Preparation of projects implementing the SO (through the smart accelerator).</i></p>
<p>Specific Objective B3 - Increasing the mobility of human resources from foreign knowledge institutions and companies into the Moravia-Silesia Region</p> <p><i>This objective will focus on the acquisition of top and other skilled foreign professionals (including qualified service personnel working with technical equipment) for their involvement in research projects in research centres of knowledge institutions and companies in our region, as the transfer of know-how from abroad is one of the primary factors in the development of professional skills of human resources in research and development in the region.</i></p>	<p><i>Number of foreign researchers and qualified service personnel in research organisations in the Moravia-Silesia Region - 220 by 2020 (with the duration of their stay of at least 3 months).</i></p> <p><i>Number of foreign researchers and skilled service workers in companies in the Moravia-Silesia Region: 90 by 2020.</i></p>	<p>Mobility and assistance services for researchers from abroad.</p> <p><i>Support for the preparation of projects implementing the SO (through the smart accelerator).</i></p>
<p>Specific Objective B4 - Increasing the number of graduates of technical fields and technical talent identification</p> <p><i>The objective responds to the long-term problem of a shortage of skilled technical labour force in technically oriented companies.</i></p>	<p><i>The number of graduates of secondary school and university technical fields employed in enterprises in the Moravia-Silesia Region -</i></p>	<p>Programme of support for student internships in companies.</p> <p>Development and application of programmes for the development of natural talent - talent support.</p> <p>Promoting technical studies and research activities.</p>

<p><i>This objective will solve the problem using continuous projects and grant schemes for promoting technical education, identification and systemic work with talented individuals in elementary and secondary schools and at universities. Great emphasis will be placed on the organisation of long-term internships of secondary school and university students in companies. The subject of activities under this objective will also be the adjustment of study programmes at secondary schools and universities according to the current and anticipated future requirements of employers. This area is mostly supported through the implementation of a number of different projects on this topic funded by the EU Structural Funds with time-limited powers. The grant schemes will ensure a systematic support of this issue in the long term. High-quality technicians are also a key prerequisite for the development of human capacity in research and development in companies. The objective will also include marketing support of technical fields and talent. This specific objective inherently contributes to the fulfilment of Specific Objectives B1, B2 and B3 and consequentially also to the creation of new jobs in technical professions in companies (to meet the high demand of companies for technical workers).</i></p>	<p><i>an increase of 15 % by 2020 compared to the current situation (2013).</i></p> <p><i>The proportion of elementary and secondary schools with an established system of identification of natural talent - 30 % of the total number in the Moravia-Silesia Region by 2020.</i></p> <p><i>The proportion of elementary and secondary schools with an established programme for the development of natural talent - 30 % of the total number in the Moravia-Silesia Region by 2020.</i></p> <p><i>Number of people involved in highly individualised programmes developing exceptionally talented students - 50 by 2020.</i></p>	<p>Teaching internships with employers.</p> <p><i>Preparation of projects implementing the SO (through the smart accelerator).</i></p>
<p>Strategies and regional documents that are used as a basis for specific objectives: The Regional Innovation Strategy of the Moravia-Silesia Region 2010 - 2020: the default document that is amended to the RIS3 of the Moravia-Silesia Region for 2014-2020.</p>		
<p>Conditions for and barriers to the implementation of interventions in the key change area:</p> <ul style="list-style-type: none"> - Sufficient interest among target groups (employees of companies, universities, research institutes, clusters, business incubators, etc.) in a specific type of education in the field of RDI (innovation management, process innovation, technology foresight, etc.). - Plenty of opportunities for the implementation of applied research and experimental development projects in cooperation with companies, within which researchers in knowledge institutions and Ph.D. students could develop their professional skills in practice. - Underestimating the importance of soft and hard skills by some researchers in knowledge institutions. - The persistent unimpressive image of the Moravia-Silesia Region as an attractive location for foreign researchers. - The persistent poor language skills of some researchers and Ph.D. students complicating their cooperation with foreign researchers. - The continuing low interest of young people in studying technical fields and pursuing technical and research careers. 		

2.3.3 Key change area C: INTERNATIONALISATION

The mission of Horizontal Priority Area C - INTERNATIONALISATION is to intensify the involvement of the Moravia-Silesia Region in international research activities, follow-up technology transfer and the strengthening of the positions of innovation small and medium-sized companies in the Moravia-Silesia Region in international value chains. The interventions under this priority area thus focus on creating and encouraging the use of opportunities in establishing international contacts and transfer of know-how and on strengthening the participation of entities in the MSR innovation system in international research and development projects. The key in this priority area is the analysis of future trends in the development of technology and demand for technology in foreign markets in relation to the area of research specialisation of the RIS of the Moravia-Silesia Region 2014-2020 (see below), especially for the benefit of small and medium-sized companies. This priority area also includes the support for export activities of small and medium-sized companies with innovation products, technologies and services.

Key change area C: INTERNATIONALISATION			
Strategic objective in Horizontal Priority Area C: Strengthening the position of the Moravia-Silesia Region in international creation and exchange of technological know-how.		Indicator of the strategic objective: The technology balance of payments of the Moravia-Silesia Region: achieving a balance by 2020.	
Description of the strategic objective: The essence of the objective is to gradually intensify the involvement of companies, universities, research institutes and other organisations (e.g. clusters) in international research cooperation for the purpose of utilisation of the export potential of technologies developed within the identified areas of research specialisation (vertical priority areas). Partial interventions will be aimed at strengthening the export performance of technological know-how (the outcome should be an increase in the volume of transactions with technological know-how with a balanced share of exports and imports). Another intervention will consist in strengthening the specific export activities of innovation companies. For this purpose, there will be support activities of the consultation and networking type and technology foresight.			
Specific objectives	Specific indicators	objective	Typical activities / projects / operations
Specific Objective C1 - Increasing the intensity of establishing international contacts and participation in international initiatives and R&D projects <i>The purpose of this specific objective is to promote the participation of researchers of universities, research institutes and companies in international research and development projects. The transfer of the latest knowledge and results of research and development of these international activities will further strengthen the abilities to efficiently and effectively implement research projects whose results will consist in new innovation products, services and technologies that are competitive in global markets.</i>	<i>The volume of drawing on the EU community programmes to promote international cooperation in R&D (Horizon 2020, Eureka, Eurostars) - CZK 250 million by 2020. Number of supported research teams in MSR research organisations participating in the EU community programmes to promote international</i>		Brokerage Events. Innovation Tour. <i>Preparation of projects implementing the SO (through the smart accelerator)</i>

	cooperation in R&D (Horizon 2020, Eureka) - 50 by 2020.	
<p>Specific Objective C2 - Raising awareness among small and medium-sized companies on trends in the development of technology and foreign markets</p> <p><i>Most small and medium-sized companies in the region only passively respond to the latest technologies and the development of demand in foreign markets in their sectors by adapting to them as necessary. However, companies should be ahead and know about the possible development trends of technologies and demand in foreign markets in order to be able to prepare for them in advance and thereby be able to develop their technological know-how and gradually strengthen their position in foreign markets (proceed to higher levels in global value chains). This is precisely the scope of this specific objective, under which, based on the application of the principles of technology foresight, companies will be provided with regular information service on the possible directions of technology development in the specified areas of research specialisation of the RIS of the Moravia-Silesia Region 2014-2020, and the associated demand development.</i></p>	<p><i>Number of conducted foresight studies on areas of research specialisation of the RIS of the Moravia-Silesia Region 2014-2020: 8 by 2020 (and updates).</i></p> <p><i>Number of prepared technology road maps for selected innovation SMEs: 32 by 2020.</i></p>	Mapping technology trends - technology foresight (foresight analyses of knowledge domains, technology road maps for SMEs).
<p>Specific Objective C3 - Increasing the export activities of small and medium-sized innovation companies</p> <p><i>The purpose of this specific objective is to stimulate the export activities of small and medium-sized companies with products, services and technologies with a high added value in the form of mapping international supply chains in relation to selected areas of research specialisation of the RIS of the Moravia-Silesia Region 2014-2020 and the export alliances of small and medium-sized companies within cluster organisations (using the facilities of large Czech companies).</i></p>	<p><i>Number of identified new/modified value chains in cluster organisations in the Moravia-Silesia Region: 5 by 2020.</i></p> <p><i>Number of supported export alliances of SMEs within cluster organisations in the Moravia-Silesia Region: 8 by 2020.</i></p> <p><i>Number of supported companies (SMEs) that have increased export by at least 20 % within 3 years or that have started exporting - 32 by 2020.</i></p> <p><i>Number of SMEs that have</i></p>	Mapping and development of international supply chains. Export alliance of SMEs.

	<p><i>increased the number of target countries within 3 years of receiving support - 10 by 2020.</i></p>	
<p>Strategies and regional documents that are used as a basis for specific objectives: The Regional Innovation Strategy of the Moravia-Silesia Region 2010 - 2020: the default document that is amended to the RIS3 of the Moravia-Silesia Region for 2014-2020.</p>		
<p>Conditions for and barriers to the implementation of interventions in the key change area:</p> <ul style="list-style-type: none"> - <i>Sufficient commitment of the MSR entities to establish cooperation with foreign partners in RDI (i.e. attending networking events/workshops actively with specific intentions that they can offer and that they are willing to further develop).</i> - <i>A real interest of SMEs to incorporate the results of foresight investigations and activities contained in the technology road maps in their internal organisational processes.</i> - <i>A sufficient ability of innovation SMEs to use the opportunities (the so-called market spaces) resulting from the analyses of the international supply chains, the willingness of large companies within clusters to provide export facilities to smaller innovation SMEs.</i> 		

2.3.4 Key Change Area D - COORDINATION AND IMPLEMENTATION OF THE RIS

Horizontal Priority Area D - COORDINATION AND IMPLEMENTATION OF THE RIS focuses on the consolidation of the innovation system of the Moravia-Silesia Region to increase the systemic nature and continuity of the activities carried out within the RIS of the Moravia-Silesia Region 2014-2020. The main scope of activities in this area is the coordination and streamlining of research, development and innovation processes of individual actors of the innovation system (among knowledge institutions, the private sector, support institutions and public administration) and the elimination of barriers to their cooperation. This activity is very important for ensuring an effective course of the implementation of the strategy and achievement of the objectives. For this purpose, there is a transparent system of implementation of the strategy based on two-year action plans (the individual action plan projects are guaranteed by the partner organisations - actors in the innovation system). An integral part is the promotion of the RIS and research, development and innovation activities in the Moravia-Silesia Region.

<p>Key change area D: COORDINATION AND IMPLEMENTATION OF THE RIS</p>	
<p>Strategic objective in Horizontal Priority Area D: Increasing the efficiency of the coordination of entities in the innovation system of the Moravia-Silesia Region.</p>	<p>Indicator of the strategic objective: Number of cooperative partnerships created within the individual areas of research specialisation and defined horizontal themes: 7 by 2020.</p>
<p>Description of the strategic objective: This strategic objective is focused on increasing the efficiency of collaboration among the various actors in the innovation system of the Moravia-Silesia Region (companies, universities, research institutes, cluster organisations, business incubators, public institutions, etc.) and on the gradual elimination of duplicate activities. Major role in achieving this strategic objective is played by the Innovation Council of the Moravia-Silesia Region, the executive unit for the implementation of the strategy (Regional Development Agency) and innovation platforms for the proposal and implementation of specific joint activities in the individual horizontal and vertical (technological) themes. An integral part of streamlining the implementation of innovation processes is also the marketing and promotion of the results of research, development and innovation of the RIS of the Moravia-Silesia Region as such for an increase in the perception of the</p>	

Moravia-Silesia Region as an innovation region by the entities in the innovation system and in their motivation for a long-term systemic cooperation.		
Specific objectives	Specific objective indicators	Typical activities / projects / operations
<p>Specific Objective D1 - Ensuring the strategic management of the implementation of the RIS of the Moravia-Silesia Region</p> <p><i>The scope of the objective is the identification of key trends/activities of implementation of the RIS of the Moravia-Silesia Region within the defined horizontal and vertical priority areas, their subsequent evaluation and proposal of appropriate actions.</i></p>	<p><i>Number of held meetings of the Innovation Council of the Moravia-Silesia Region - 14 by 2020 (2x per year).</i></p>	<p>Meetings of the Innovation Council of the Moravia-Silesia Region.</p>
<p>Specific Objective D2 - Ensuring effective implementation of the RIS of the Moravia-Silesia Region</p> <p><i>The specific objective is focused on the coordination of individual activities in meeting the specific objectives of the horizontal priority areas and technology domains. Effective implementation of the RIS of the Moravia-Silesia Region is based on a two-year action plan system with specific activities/projects for the specific objectives of the horizontal priority areas including their description, the implementer, the schedule, budget, funding resources and the implementation indicator with the target value. An important role is also played by innovation platforms for the individual vertical (technological) and selected horizontal themes, within which their members are supposed to identify and implement collaborative activities/projects fulfilling the specific objectives of the RIS of the Moravia-Silesia Region. All of these activities are provided and coordinated by the executive unit of the RIS of the Moravia-Silesia Region (the Regional Development Agency) in cooperation with the Regional RIS3 Manager. This objective is also to support the development of project documentation of action plan projects applying for co-financing from operational programmes, community programmes of the EU and national grant programmes (the so-called smart accelerator).</i></p>	<p><i>Number of prepared, implemented and evaluated two-year action plans: 3 by 2020.</i></p> <p><i>Number of established functional innovation platforms: 7 by 2020.</i></p>	<p>The activities of the executive unit to implement RIS3 of the Moravia-Silesia Region (RIS3 Manager).</p> <p>Meetings of innovation platforms.</p> <p>Support for the preparation of project documentation of the projects under the RIS3 of the Moravia-Silesia Region applying for co-financing from operational programmes (smart accelerator).</p>
<p>Specific Objective D3 - Increasing the promotion of the results of research and development and the RIS of the Moravia-Silesia Region</p> <p><i>The essence of this specific objective is to strengthen the image of the Moravia-Silesia Region as a developed innovation region</i></p>	<p><i>Number of prepared, implemented and evaluated communication plans of the RIS of the Moravia-Silesia Region - 4</i></p>	<p>Marketing support of grants. Innovation press trip. Competitions. Innovation web.</p>

<p><i>through targeted marketing activities. These marketing activities will focus on presenting the results of high-quality applied research and development of research centres and major personalities involved in RDI in the Moravia-Silesia Region in the academic and corporate sectors. The marketing activities will include the promotion of RIS3 of the Moravia-Silesia Region as such for the purpose of building and strengthening the “MSR RIS” brand symbolising the dynamic region that bases its competitive advantage on the unique knowledge concentrated in the individual areas of research specialisation (technology domains). The said marketing activities will lead to an increase in the sense of belonging among the entities in the regional innovation system and to a motivation for more intensive and effective cooperation.</i></p>	<p>by 2020.</p>	
<p>Strategies and regional documents that are used as a basis for specific objectives: The Regional Innovation Strategy of the Moravia-Silesia Region 2010 - 2020: the default document that is amended to the RIS3 of the Moravia-Silesia Region for 2014-2020.</p> <p>Conditions for and barriers to the implementation of interventions in the key change area:</p> <ul style="list-style-type: none"> - <i>A large number of entities in the innovation system of the Moravia-Silesia Region hampering the coordination of activities in RDI</i> - <i>The persistent tendency to prepare and implement duplicate activities by the actors of the innovation system</i> - <i>The need for an effective coordination of the integrated tools (RIS3, ITI, LAG, etc.), within which there may be an overlap of interventions/activities</i> 		



2.4 Vertical priority areas - technology domains

In accordance with the concept of smart specialisation (RIS3 - Research and Innovation Strategy for Smart Specialisation), on the basis of which the RIS of the Moravia-Silesia Region 2014-2020 was processed, the analytical part identified the following areas of research specialisation (vertical priorities or “technology domains”), whose implementation will be the focus of the individual specific objectives defined within the horizontal priority areas. The technology domains were discussed and approved by the Innovation Council of the Moravia-Silesia Region in November 2013.

Definition and a brief description of the research specialisation areas - technology domains:

1. **Advanced materials and materials with low energy demand, their development, production and processing technologies (including the use of nanotechnology) and combining (alloys, stainless steel, composites, aluminium, plastics, natural materials)** - this area represents the traditionally strong materials research typical of the Moravia-Silesia Region, whose results are applicable across a broad portfolio of manufacturing (mechanical engineering, the automotive industry, electrical engineering, etc.) including energy and recently also medical fields.
2. **Special machinery, equipment and technological processes of industrial automation for manufacture and testing** - this research direction responds to the growing demands of companies (especially in the field of mechanical engineering and the automotive industry) for technically sophisticated and at the same time cost-optimal production facilities integrating elements of measurement and a continuous quality control of the manufactured components.
3. **Mechatronic systems and equipment (including the related modelling and simulation)** - this is a promising research field combining elements of mechanical engineering, electrical engineering and IT, the outputs of which are applicable in many technological applications or specific products throughout the manufacturing industry, energy and medical engineering.
4. **Regenerative medicine, genomics and new approaches to data analysis** - the research field of regenerative medicine has an enormous application potential in medical practice (particularly in the field of stem cells and related personalised medicine); to achieve adequate qualitative results of the success rate of regenerative medicine methods, the field includes the key support areas of research in genomics and multi-criteria structured data stores and sophisticated statistical analysis of biological data (bioinformatics, biostatistics).
5. **Processing and use of secondary raw materials and waste in the conditions of the Ostrava agglomeration (using the infrastructure of the original mining facilities, former industrial sites - brownfields, etc.), development of non-waste production technologies** - this involves the development and application of technologies for the treatment of industrial waste, biological waste and other alternative raw materials (used oil, etc.) originating from production processes and old ecological burdens for their further application in industrial production and energy processes including new technological processes for the prevention of industrial waste (especially in metallurgy, mechanical engineering and the automotive industry).
6. **Smart grids and smart cities using the specifics of the Moravia-Silesia Region in the process of changing its technological profile** - geothermal energy, methane gas, co-generation and accumulation, underground infrastructure - the field of intelligent energy networks and their wider application within the concepts of intelligent management of energy and environmental transportation technologies in municipalities has a high application potential in terms of the Moravia-Silesia Region, taking into account the advanced “conventional” energy infrastructure combined with new possibilities of production of energy from alternative and renewable sources (co-generation technology - combined production of electrical energy and heat), of which there is enough in the Moravia-Silesia Region; there is also the related issue of efficient storage, distribution and regulation of energy (electricity and heat energy); in the development of sophisticated smart energy technology, there is of course the potential of application of the results beyond the Moravia-Silesia Region.
7. **Integrated security systems (development of comprehensive security systems for the private and public sectors) including elements of environmental prevention and protection (pollutants, epidemiological phenomena)** - this research field includes a wide range of security technologies for industry (to prevent damage to property, production and human health) and public institutions for the

prevention and elimination of natural disasters (floods, fires, etc.) including the technology of monitoring and modelling of negative environmental phenomena that threaten public health.

8. **Supercomputer methods for solving engineering problems, application in science and technology, modelling and simulation of phenomena and situations with the impact on human activity** - these methods provide technical support for research activities described in the above areas of research specialisation, but also for other activities of science and research and socio-economic nature.

2.5 Implementation structure

Regional Innovation Council (RIC): Innovation Council of the Moravia-Silesia Region (IC)	<i>Number of members from the business community: 7</i> <i>Number of members from research organisations: 6</i> <i>Number of members from public administration bodies: 7</i> <i>Number of members of intermediary institutions supporting RDI: 6</i>
Date of establishment of the Regional Innovation Council	<i>5/2013 by resolution of the Board of the Regional Council (formerly the Coordination Board, informally established in 2009)</i>
Dates of IC meetings held so far:	<i>2x per year</i>
Dates of preparatory meetings prior to the establishment of the Regional Innovation Council:	<i>continuously</i>
Innovation platform: ClusterNet	
Number of members of the innovation platform	<i>8</i>
Dates of meetings of innovation platforms held so far, including preparatory meetings:	<i>2x per year (since 2009)</i>
Innovation platform: Start-ups	
Number of members of the innovation platform	<i>5</i>
Dates of meetings of innovation platforms held so far, including preparatory meetings:	<i>2x per year since 2012</i>
Expected executive unit for the coordination and implementation of the regional RIS3:	
	<i>Regional Development Agency, joint-stock company</i>
Owners/authorities of the executive unit and their shares in %:	<i>Moravia-Silesia Region - 100 %</i>

