

The Śląskie Voivodeship Assembly

Regional Innovation Strategy of the Śląskie Voivodeship for the years 2013-2020

Katowice 2012



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- The Śląskie University of Technology,
- The Science and Technology Park "Technopark Gliwice" (until 2011),
- University of Economics in Katowice.

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Dear Readers,

It has been ten years since we together undertook the ambitious task of becoming a region of innovative economy. The Regional Innovation Strategy, created under the project "RIS Silesia", which we adopted for the years 2003-2013, have delivered its function. Numerous economists, academics, business institutions and civic societies were actively involved in its realisation.

Aspirations related to the creation of modern approaches, open for change and new challenges, come to being in our region in numerous business cooperation nets, scientific-business partnerships and individual development strategies of companies and academic circles. Those are undoubtedly the achievements to which you all contributed in the recent years, not only by engaging in development processes within your institutions, but also by cooperation at the regional level.

However, we have new challenges to face. A region with our economic position cannot stand still. We have to be more reactive than ever towards the changes brought to us by globalization of business and scientific-technological activities. In the modern world reaching for resources on a global scale is no surprise. Therefore, it is not as much what we have "here and now", but rather our ability to join the global supply and value creation chains, that will define our strength.

In order to achieve this, we have to develop our regional potential and make strategic alliances on at least European scale. This in turn will be possible only on the condition that we are able to focus on the most important thematic fields, where we can gain an international advantage. The Śląskie Voivodeship is ready to become a European region on competence in selected fields; in other fields we may offer such level of products, technologies or scientific research that will win approval on international markets. Those issues should become our ambition in the following years.

This is why I hand over to you the document of Regional Innovation Strategy for the years 2013-2020. Its provisions have been determined by various groups within our region: in the course of thematic seminars and conferences, by work of commissions appointed by the Śląskie Voivodeship Assembly, by consultation with the Śląskie Innovation Council and the Steering Committee of Regional Innovation Strategy during workshops. I am convinced that the regulations of the Strategy reflect the aspirations and expectations of us all, and that we will make use of the upcoming years to realize them to the full.

Adam Matusiewicz

The Marshal of the Śląskie Voivodeship

Uchwała Nr IV/29/5/2012
Sejmiku Województwa Śląskiego
z dnia 20 grudnia 2012 roku

w sprawie:
przyjęcia *Regionalnej Strategii Innowacji Województwa Śląskiego*
na lata 2013-2020

Na podstawie: art. 11 ust. 2 pkt 6, art. 18 pkt 20
ustawy z dnia 5 czerwca 1998 r. o samorządzie województwa
(tekst jednolity: Dz. U. z 2001 r. Nr 142 poz. 1590 z późn. zm.)
oraz art. 14 ust. 3
ustawy z dnia 6 grudnia 2006 roku o zasadach prowadzenia polityki rozwoju
(tekst jednolity Dz. U. nr 84 z 2009 roku, poz. 712 z późn. zm.)

Sejmik Województwa Śląskiego
uchwala:

§ 1.

Przyjmuje się *Regionalną Strategię Innowacji Województwa Śląskiego na lata 2013-2020*, stanowiącą załącznik do niniejszej uchwały.

§ 2.

Wykonanie uchwały powierza się Zarządowi Województwa Śląskiego.

§ 3.

Uchwała wchodzi w życie z dniem podjęcia.

Przewodniczący Sejmiku
Województwa Śląskiego


Andrzej Gościński

**Resolution No. IV/29/5/2012
of the Śląskie Voivodeship Assembly
of December 20, 2012**

**on:
adoption of *Regional Innovation Strategy of the Śląskie Voivodeship
for the years 2013-2020***

*Based on: Art. 11, paragraph 2, point 6, Art. 18 point 20
of the Act on Voivodeship Government of June 5, 1998
(unified text: Journal of Laws of 2001 No. 142, item 1590, as amended)
and Art. 14, paragraph 3
of the Act on the Principles of Development Policy of December 6, 2006
(consolidated text: Journal of Laws 2009 No. 84, item. 712, as amended)*

**the Śląskie Voivodeship Assembly
shall pass:**

§ 1

The Regional Innovation Strategy of the Śląskie Voivodeship for the years 2013-2020 shall be adopted, which is attached to this resolution.

§ 2

The implementation of the resolution shall be entrusted to the Voivodeship Government.

§ 3

The resolution shall come into force on the date of adoption.

**President
of the Śląskie Voivodeship Assembly**

Andrzej Gościński

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1. Leading ideas of innovative changes

1. Leading ideas of innovative changes

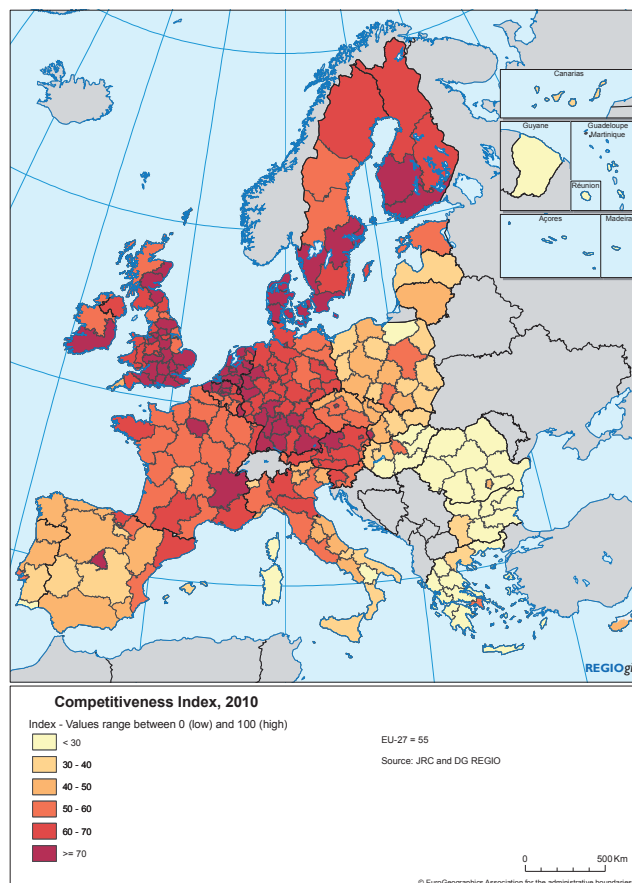
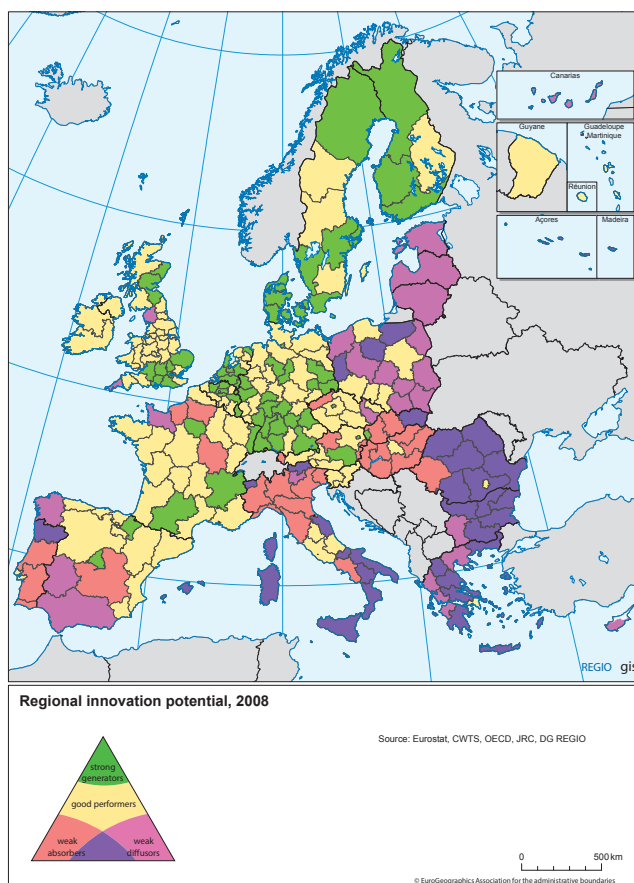
1.1. Macro-processes shaping the innovative changes in the regions

Due to the successive waves of the global crisis, statistical indicators based on data from 2 or 3 years ago does not allow for a fully reliable picture of economic situation. Nevertheless, cross-cutting indicators, even those describing the condition from before the crisis, shown in a wider European context, give us approximate information about the economic and competitive profile of the region.

In the Fifth European Commission report on economic, social and territorial cohesion (2010) regions are broken into categories according to their innovative potential. As was indicated in the map reprint shown to the side, the Śląskie Voivodeship is regarded to be a region with good results. It is worth noting, however, that this is the highest category among Polish regions, for none was included in the so-called strong generators group.

In the very same report also the results of competitiveness indicator comparison. The presented map reprint indicates that the Śląskie Voivodeship acquires an average indicator on the European scale, but together with the Masovian Voivodeship it constitutes the group of country's strongest regions. It is also dominant with regards to the neighbouring cross-border regions.

The European data summary on net domestic product in 2008 in current prices per inhabitant on NUTS2 level renders the information assembled in the below chart, procured on the basis on EUROSTAT data available at the end of 2011.



POSITION	REGION	2008 PER CAPITA GDP (EUR)	% OF AVERAGE VALUE EU
1	Inner London	88 300	353
2	Luxemburg	81 200	324
3	Région de Bruxelles-Capitale	60 600	242
4	Groningen	53 800	215
5	Hovedstaden	52 400	209
6	Stockholm	49 200	196
7	Hamburg	49 100	196
8	Île de France	47 800	191
9	Southern and Ekstern	45 000	180
10	Wien	44 600	178
[...]			
219	Masovian Voivodeship	15 000	60
[...]			
228	Moravskoslezsko	12 200	49
[...]			
232	Západné Slovensko	11 400	46
[...]			
236	the Śląskie Voivodeship	10 300	41
[...]			
238	the Dolnośląskie Voivodeship	10 200	41
239	the Wielkopolskie Voivodeship	9 900	40
[...]			
243	the Pomorskie Voivodeship	9 000	36
244	the Łódzkie Voivodeship	8 900	35
245	the Zachodniopomorskie Voivodeship	8 600	34
[...]			
247	the Małopolskie Voivodeship	8 200	33
248	the Lubuskie Voivodeship	8 200	33
249	the Kujawsko-Pomorskie Voivodeship	8 200	33
250	the Opolskie Voivodeship	8 100	32
[...]			
252	the Świętokrzyskie Voivodeship	7 600	30
[...]			
255	the Warmińsko-Mazurskie Voivodeship	7 100	28
[...]			
257	the Podlaskie Voivodeship	7 000	28
[...]			
259	the Lubelskie Voivodeship	6 600	26
260	the Podkarpackie Voivodeship	6 600	26
263	Nord-Vest	5 800	23
264	Sud-Est	5 400	22
265	Sud – Muntenia	5 400	22
266	Sud-Vest Oltenia	5 000	20
267	Severoiztochen	4 000	16
268	Nord-Est	4 000	16
269	Yugoiztochen	3 800	15
270	Severen tsentralen	3 200	13
271	Yuzhen tsentralen	3 200	13
272	Severozapaden	3 000	12

The Śląskie Voivodeship is particularly undergoing environment changes of two types that condition its innovative development. First, one must stress the structural changes in regions, especially in industrial regions and those formed in IXI/XX century. Those social and economic changes are often manifesting through changes in regional competitiveness and the related demographic, cultural, economic, environmental or spatial effects. Various European regions are presently in different stages of coping with changes of that kind. This always requires courage in undertaking new solutions, creativity and consequence. Another crucial type are civilization changes, expected by regional groups of subjects, willing and actively participating in dynamization of the sphere of regional community's well-being and the development of democracy with its entailed social order, both in the sphere of creating and redistribution of income and the benefits they result in.

Many searchers claim that the dynamics of changes happening in regions is explained, and the regions' future is possibly influenced by the following processes: globalization, digitalization, ecologization, individualization, social adaptability, decrease in the consumption of material resources including energy, creating added value through creative economy and knowledge economy, growth of competence and skills. Each of those processes may exert different pressures on the participants of competition for the region's development, or shape their visions of civilization changes, as well as evoke structural changes.

From the regional policy creation perspective, one particularly important aspect of recognizing changes in the environment and further identifying the strategic challenges of the region's innovative development is a common approach based on confronting change processes on markets with change processes in conducting development policy understood as an intervention of public authorities. A concept base of this assumption is the market failure theory.

1.2. Innovative policy perspectives of the Śląskie Voivodeship

In the Śląskie Voivodeship the time of economic transformation was well employed. In the 90's in the XX century the focus was on supporting entrepreneurship. On the local level infrastructure was developed in this scope and a lively structure of institutions surrounding business and local development was created. It was on their basis that in the beginning of the XXI century foundations of pro-innovative policy were created in the voivodeship. Research and development sector was involved in those works. Pre-access means and financing from structural funds were used for developing many instruments of regional policy - both those referred to as "soft" and the infrastructural ones.

At present it might be said that a significant institutional maturity of supply-related aspect of the region's policy has been reached. Also, there exists a very extensive offer of support services for innovation development. Still, we have not reached enough dynamical innovative activities at a regional scale, not the stabilization of sources and streams of financing for pro-innovation and innovative actions. A full diagnosis in that scope was presented in the study materials, developed as a part of preparations for this strategy and in the external evaluation team report, procured in 2011 for the Marshal's Office of the Śląskie Voivodeship "Current evaluation of implementation processes of the Regional Innovation Strategy of the Śląskie Voivodeship for 2003-2013. Final report" („Bieżąca ewaluacja procesów wdrażania Regionalnej Strategii Innowacji Województwa Śląskiego na lata 2003-2013. Final report"). Therefore, the leading idea of innovative policy of the Śląskie Voivodeship in the 2013-2020 is the balancing of demand and supply aspects and the related stabilization of institutional and financial arrangements.

The task of region's innovative policy is to inspire for innovativeness and to create conditions for reaching market leadership, as well as to ensure technological development wither through reaching perfection

in selected fields or through acquisition of technologies from global markets and settling it in the Śląskie Voivodeship. What is equally important is to simultaneously strengthen leadership in business circles and in the actions of public authorities, which allows for a sort of synchronization between the influence of market mechanism and the necessary intervention via policy tools.

The role of the strategy is to activate a dialog and to regulate the activity of numerous actors in the region, which in the upcoming years will allow us to face the challenges of innovative development of the Śląskie Voivodeship together. In the modern world the sense of closeness is blurring out. Thanks to extensive logistic systems and the Internet as well as other means of telecommunication "within reach" may mean the same as "on the other side of the world". Industrial district theories, business cluster theories and the like proving ever less correct. A mode of thinking characterized by a global perception of resources and markets is becoming mainstream. In these circumstances innovative policy of the Śląskie Voivodeship must not appear to be a result of perceiving potential and activities encapsulated in the region's administrative borders. Its task is to response to strategic challenges in a way that will:

- allow selected regional milieux to become present in international relations and on the global markets, and on the other hand
- increase selected milieux in the region to such extent as would make them a magnet, drawing global resources to the Śląskie Voivodeship, creating a "snowball effect".

Moreover, an innovative policy is assumed which will extend beyond technological research and its usage. To realize under the strategy a broadly understood innovation concept covers using it in private and public services, product creation, management process enhancement and organization systems as well as in creating new business models.

The key strategic challenges of the Śląskie Voivodeship innovative development are:

- risk management in financing innovative activity of businesses,
- stimulating innovative potential of capital groups and industrial corporations,
- information asymmetry elimination and knowledge management in public innovation support system,
- diffusion of innovation concentrated on the user in public services sector,
- knowledge economy infrastructure development,
- creating smart markets for future technology,
- designing innovation culture.

The deadline for facing the above challenges is the year 2020.

Taking into account the above mentioned assumptions that public intervention may serve exclusively as a catalyst of selected processes or incubate the selected solutions in the fields of market mechanism failure, the local authorities will take into account the following strategic design and pursue principles of a policy, supporting innovation ecosystem in the Śląskie Voivodeship:

Policy designing principles:

- the principle of social dialog, which is the basis of partnerships for innovation,
- the principle of partnership among government entities, local authority entities, business sector, knowledge and education sector and civic sector,
- the principle of focusing on selected fields of technological development,
- the principle of increasing availability of educational services on different stages of competence structuring.

Policy pursuing principles:

- the principle of continuous investments in knowledge capital development,
- the principle of strengthening the region's attractiveness by means of developing public services net,

- the principle of creating new workplaces in the "emerging" professions related to future technologies,
- the principle of creating conditions for internationalizing the economy,
- the principle of valorisation of technological competence, creative milieux and local communes.

1.3. Smart specializations of the Śląskie Voivodeship

European Commission guidelines on the so-called third generation regional innovation strategies, published in 2011 in a textbook by the European Commission's Directorate General for Regional and Urban Policy, specify expectations towards European regions regarding strengthening smart regional specializations, manifested by:

- several investment priorities of business potential and in perspective specialization fields;
- building on the region's existing business specializations and mobilizing talents by means of combining the needs and possibilities of research and development sector as well as business;
- aiming at the development of world-class clusters and creating space for various inter-sector bounds, propelling diversification processes in the conditions of increased participation in meta-regional networks;
- including in pro-innovative processes not only academic institutions, companies and public authorities, but also the recipients, users of innovations.

Such an approach constitutes an ex ante condition of allocation of structural funds of the objective 1. of the future financial perspective of the EU, according to the state of the proposed regulations as of October 2012.

The Śląskie Voivodeship is a region of successful restructuring. A new economic and academic tissue of the region is settling after more than 20 years from the systematic change which shook the foundation of operation of traditional industries, such as mining, metallurgy, power or textile industry. On the one hand, many transformations took place thanks to good use of entrepreneurial skills of the region's inhabitants who, establishing small and gradually developing companies, created entities and activities that are basic for every local economy. Without this radical change, supported by numerous programs promoting entrepreneurship and incubating new companies, today it would not be possible to speak of relatively stable local and regional labour markets. On the other hand, the industrial picture of the Śląskie Voivodeship has changed. A wave of adaptation processes, including the privatization of certain sectors, combined with the influx of external investors, drawn by the offer of Katowice Special Economic Zone and other local zones and investment grounds entailed an increase in production effectiveness and the balancing of its sector arrangement. The Śląskie Voivodeship ceased to be an industrial monoculture region and became a multi-industry region, created not only by companies in the region's traditional fields, but also by firms in completely new areas and specialized entities, offering niche products and thus included in global supply chains. Restructuring of economy became an impulse for changes in the research and development sector. Region's research institutes adapt their offer and the scope of performed works to the changing reality and also intensify international cooperation as well as their participation in European research and expert networks. Similar transformations pertain to the academic activities of universities, which additionally develop education in numerous new faculties and specializations.

The Regional Innovation Strategy of the Śląskie Voivodeship for the years 2003-2013 was the first regional document oriented at strengthening innovation processes. According to what regional economy needed at that time, as well as in compliance with the methodology that was then recommended and applied in the European Union, that strategy featured a functional approach. Its regulation emphasized the creation of possibly full set of tools for supporting innovativeness – to a large extent understood as the transfer

of knowledge to SME – in all fields of economy. In this document several field of economic life were indicated that needed particular attention as the key aspects for the region's innovative development. As it was stated in the text of the discussed Strategy: many outstanding academics are active in the Śląskie Voivodeship, employed in institutions with high-class scientific devices, which may become a basis for developing new specializations regarding:

- biotechnology, including bioengineering, biology and health technology,
- technology for power industry, including the production of energy from renewable sources, incineration and thermal utilization of waste and energy saving,
- environmental protection technologies, including biogeochemical and waste management engineering,
- information and communications engineering,
- production and processing of materials, including advanced materials.

The ideas of Regional Innovation Strategy found their continuation in 2006, when technological foresight was launched in the region, and realized under the motto "Priority technologies for the Śląskie Voivodeship sustainable development". In foresight works detailed analyses were conducted in the thematic-technological fields, i.e.:

- biotechnologies,
- technologies for power industry,
- environmental protection technologies,
- information and communications technologies,
- production and materials processing technologies,
- transportation and transport infrastructure technologies,
- medical engineering technologies.

Branch potential, environment and SWOT analyses were conducted, scenarios and road maps were created with 2020 perspective in mind. As a result of foresight, employing the critical (key) technologies method, technology portfolio of the Śląskie Voivodeship was defined, establishing that key technologies might be classified into strategic groups by evaluating them jointly, using the criteria of: key technologies co-dependency and the direction of their influence on the region's development. In this way 4 groups were defined, the layout and scope of which is depicted on the region's technological portfolio scheme. According to its logic:

- First solutions to be deemed strategic are those related with the above described groups 'A' and 'B', for they are linked with technologies that are present in the region and can be developed to a large extent on the basis on own resources and skills in order to become a product transferred to world's markets.
- Second, supporting role of innovative development in 'C' group fields should be regarded as key. Those technologies or their core technical solutions might be successfully purchased on world markets, and their sole implementation in the region becomes and will continue to become a propelling factor for technical competence and innovative potential of businesses as well as research and development units in the Śląskie Voivodeship.
- Other pro-innovative activities ('D' group and others) should be perceived as supplementary, but not strategic, for their usage is a civilization attainment and therefore they should not be neglected for the sake of both economic and social processes in the Śląskie Voivodeship.

TECHNOLOGY PORTFOLIO OF THE SILESIA VOIVODESHIP			
INFLUENCE ON THE REGION'S DEVELOPMENT	Exogenous technologies	D Group Island and exogenous technologies <ul style="list-style-type: none"> • Spatial information management technologies • Non-ferrous metal production • Polymer plastics -moulding • Medical education 	C Group Nodal and exogenous technologies <ul style="list-style-type: none"> • Environmental protection biotechnology • Technologies for the removal of problem substances from soil and water environment and sewage • Dust technologies • Fluid technologies • IT infrastructure technologies • Smart transport management system technologies • Smart knowledge system technologies • IT technologies • Human transportation technologies
		Endogenous technologies	B Group Island and endogenous technologies <ul style="list-style-type: none"> • Artificial organs • Telemedicine • Advanced diagnostic and therapeutic tools • Medical infrastructure technologies and equipment
INTERDEPENDENCE OF KEY TECHNOLOGY GROUPS			
		Island technologies	Nodal technologies

In 2009 in the Śląskie Voivodeship, taking into account the findings of Regional Innovation Strategy and technological foresight began the development and implementation of Technology Development Programme for the years 2010-2020. Also numerous field foresights as well as field, sector documents and development programs published both on both state and regional level were taken into account. The focus of the document was on the establishing of conditions for the particular components of technologies derived from road maps, developed under foresight. Also SWOT analyses of the technological and innovative potential of the region were conducted. Technology Development Programme is a sort of guide to the advancement of the state of technology development in particular technological branches, and it delimits the fields of region's technological specialization. Those are:

- medical technologies,
- technologies for power and mining industries,
- technologies for environmental protection,
- information and communications technologies,
- production and processing of materials,
- transportation and transport infrastructure,

- machine, automotive, aircraft and mining industries,
- nanotechnologies and nanomaterials.

The documents and activities described above, which are being realized in the region, depict the **regional specializations of the Śląskie Voivodeship**. They indicate a consistent involvement of both the region and innovative communities in the region in the development of selected branches of science and economy, enabling global market advantage or technological advancement of fields and sectors of the Śląskie Voivodeship economy, as well as the design of entrepreneurship and labour market in the regional and sub-regional aspect.

This Regional Innovation Strategy for the years 2013-2020 is complementary to those arrangements. It uses the attainments of the to-date programming and from the angle of innovative development strategic challenges of the Śląskie Voivodeship focuses of thematic issues, around which the region should strive to concentrate actors from business and academic circles, as well as business-related institutions, NGOs and local authorities. The adopted thematic approach towards the creation of innovation and innovative policy of the region entails – in connection with world's attainments – to first and foremost strengthen and employ the endogenous potential for the enhancement of the situation in the region and gaining advantages in the global scale. Bearing this in mind, the strategic provisions of the innovation policy of the Śląskie Voivodeship, presented in the following chapters of this document, as well as implementation provisions focus on the following thematic **smart specializations of the region**:

- power industry
 - which is an important economy sector of the region and of national economy,
 - for which due to the existing infrastructure equipment (energy production, transfer and consumption) and high density of population and localizations of industry in the region,



the Śląskie Voivodeship is a perfect background for testing and full-scale implementation of innovative solutions,

- which generates suction effect not only in the scope of technology for power industry, but also for modern solutions in the scope of environmental protection, IT and automation or machine industry,
- in which the employment of renewable energy sources in professional and industrial energetics as well as in prosumer groups – business and housing - is gaining importance,
- which in broad sense constitutes the first and most important field of creation, testing and usage of smart media distribution network technologies, experience from which can be transferred to other so-called smart markets;

■ medicine

- which is one of the factors differentiating the Śląskie Voivodeship from the rest of the country for its perfection in numerous fields of prevention, therapy and rehabilitation and recognition of medical engineering products,
- important as an element of public services system in the context of the vision, presented in the 'Śląskie 2020' strategy, where the region is described as enabling access to high-quality public services,
- which is permanently linked to creation, adaptation or absorption of technologically advanced solutions in the field of medical engineering, biotechnology, materials engineering, IT and electronics,
- which is aided by IT and telecommunications technologies in the scope of *in silico research*, as well as remote prevention and diagnostics, and also treatment of complex cases,
- in which smart market or quasi-market systems are developed, related to the treatment of an insured person in the public system or in private systems, including international ones;



- information and communication technologies
 - that have a horizontal meaning for technological, economic and social development thanks to the increase of knowledge accessibility and enabling the creation and distribution of goods and services,
 - that enable participation in global cooperation networks and creation of transaction and management systems, related to smart markets,
 - related to the creation, adaptation or absorption of technologically advanced solutions of materials engineering and electronics as well as with the use of design as an important link, crucial to the success of connecting a technology and product which bases on it with their user,
 - the use of which is one of the contemporary civilization competences of individuals and communities, as well as innovative communities.

The approach present in this Regional Innovation Strategy of the Śląskie Voivodeship for the years 2013-2020 should not be confused with sector approach, since it opens development perspective for small, medium and large companies, research and development institutions, support organizations as well as organized and individual users (prosumers) of innovations focused on specific topics, regardless of field. Key is the ability to join the value chains characteristic of particular thematic solutions, both on the regional and most importantly on the global scale.



2. Strategic decisions of innovation of the Śląskie Voivodeship

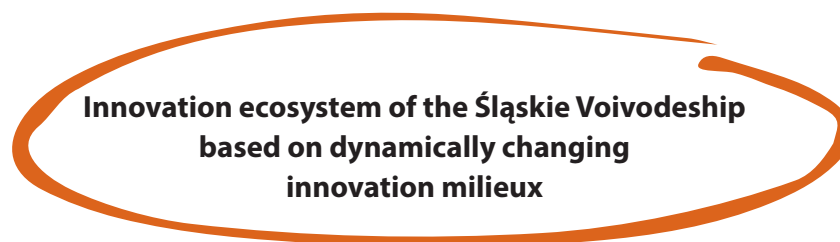
2. Strategic decisions of innovation of the Śląskie Voivodeship

2.1. The vision of the Śląskie Voivodeship innovation ecosystem

One of the turning points in the Regional Innovation Strategy of the Śląskie Voivodeship for the years 2013-2020 was the creation of the Regional Innovation System, based on cooperation networks among business support organizations, the R&D sector, local authorities and businesses, that has functioned since 2005. According to the opinion expressed in the document "Current evaluation of implementation processes the Regional Innovation Strategy of the Śląskie Voivodeship for the years 2013-2020. Final report." („Bieżąca ewaluacja procesów wdrażania Regionalnej Strategii Innowacji Województwa Śląskiego na lata 2003-2013. Raport końcowy”), developed in 2011 for the Marshall’s Office of the Śląskie Voivodeship, this assumption was partially realized. According to the report, this was caused by a "too low level of cooperation, particularly among businesses and the academics". Moreover, the evaluation showed that "the Regional Innovation System of the Śląskie Voivodeship, based on cooperation networks, is functioning poorly – there are problems with maintaining its stability and internal integration". The text of the evaluation of the to-date Regional Innovation Strategy points to the fact that "a large number of institutions and organizations indicates a very wide scope of inter-institutional cooperation under the Regional Innovation System. However in the opinions of representatives the mutual interference and common initiatives lacks proper dynamics. Still, in comparison with other regions of Poland the cooperation is relatively intense, and the continuation of the cooperation depends of external financing".

In this, actualized, Regional Innovation Strategy, embracing the years 2013-2020, development and transformation of the regional innovation system into an innovation ecosystem is assumed. The Ecosystem perspective means: mutual shaping of processes, generating solutions that would not be separated in the aspect of their functions, but naturally interfering in thematic arrangements, as well as coexistence and cooperation of actors, building relationships in various configurations, depending on their common aspirations and conditioning from the environment. The ecosystems is characterized by an atmosphere and conditions for creating innovation as well as the ability to undertake self-mastery. It generated coordinated activities that strengthen elements and internal bonds, but on the other hand it gains resources and develop bonds on a larger scale, aptly making use of its assets and advantages over others.

Due to the above stated the designed picture of the region’s future – the main idea of its innovative development – might be expressed as:



Strengthening the regional innovation system and its conversion in the 'ecosystem' direction is an ambition that integrated innovation milieu of the Śląskie Voivodeship, to which the following are subordinate: the agreed priorities of the region’s innovative development as well as common and individual activities of all participants of innovative processes in the Śląskie Voivodeship.

Accepting the proposition to create an innovation ecosystem is an answer to the challenges of the modern regions. It is compliant with the recommendations of the European Commission in the scope of the so-called third generation innovations, included in the textbook, published in December 2011 in relations to the "Smart Specialisation Platform" initiative. This concept is also entering the policies of such countries as Finland, France or USA.

Introducing the notion of ecosystem into the regional innovation system is most of all related to the necessity of a more extensive approach to problems of the functions of actors in the innovative development of economic, academic and civic society environment. Approaching them jointly allows underlining the diversity and value of the region and in this way the introduction of identity and regional specialization into thinking about the innovative development of the Śląskie Voivodeship. Simultaneously, another factor is taken into consideration – namely, that in the logic of modern innovation management particular stress is put on the present globalization of resources. The importance of resource ownership and localization is being limited, while the importance of global scale resource accessibility is being raised. Therefore the ability to participate in global value creating chains is a new competitiveness factor. Gaining this advantage becomes possible through developing proper relations among regional entities on a global scale. Taking into account an approach so understood, the characteristics of the innovation ecosystem of the Śląskie Voivodeship – its milestones which will delimit the first stages of the ecosystem's development – are:

- 1** Regional system of information about the region's innovative activities
- 2** *World Class Clusters*
- 4** common research and development infrastructure objects in the region
- 8** key competence centres in priority fields of Technology Development Program
- 16** *living labs* concerned with smart markets
- 32** UE frame projects whose leaders are entities from regions
- 64** scientific and research consortia in the region
- 128** thousands of people employed in innovative businesses
- 256** per a thousand businesses classified as innovative
- 512** million EUR allocated to innovative activities
- 1024** thousands of inhabitants of the region included in the activities in the field of creativity and innovativeness

The realization of the Regional Innovation Strategy is devoted to reaching the above listed milestones. Those objectives are identified on the basis of two priorities of developing the innovation ecosystem of the Śląskie Voivodeship and five strategic fields of public intervention.

The priorities of innovation ecosystem are:

- Increasing and internal integration of the region's innovative potential. This priority is related to the continuation of the hitherto effective and efficient measures strengthening the readiness of businesses, institutions and the society in the region to face subsequent new innovation challenges and to realize scientific and economic enterprises of key importance for the development of a region. This does not mean simple continuation of the existing activities, but their validation, the development of a new kind of infrastructure and services and the increase of the scale of interactions in the innovation ecosystem of the Śląskie Voivodeship. The objective under this priority will be realized within incremental development processes.
- Creating smart markets for future technologies. This priority regards the opening of businesses, institutions and society in the region for participation in value chains and usage of new business models in relation to the expanding scale of transformations in the direction of the so-called smart



markets and the related prosumer behaviours. The priority's essence is to strengthen competence both for operating this sort of markets from the technological and social perspective (consumer behaviour) and building lasting ability to create and participate in such markets. The objectives under this priority are oriented for making breakthrough technological and product changes.

The following are regarded to be fields of public intervention:

- creating knowledge and innovation communes as an answer to the assumptions of innovative policy of the European Union and the country and creation of nodal institutional solutions for gaining smart specializations of the Śląskie Voivodeship,
- the development of technologically advanced public service networks as an innovative supply for realization of the 'Śląskie 2020' strategy and the basis for drawing to the region global resources, necessary for the realization of scientific and business activities of key importance for the Śląskie Voivodeship,
- reference character of the regional innovation ecosystem infrastructure as the basis to perform scientific as well a research and implementation-related activity compliant with the worlds best available technologies,
- including SME as sources of innovations into global chains, as the core of internationalization of businesses and building their lasting competitive advantage on meta-national markets,
- the creation of talents and strengthening of competence as the driving force of all innovation processes in the region both stemming from social attitudes and accumulated in the know-how and human capital of companies.

2.2. Main strategic decisions chart

REGIONAL INNOVATION ECOSYSTEM OF THE SILESIAN VOIVODESHIP	
VISION	
STRATEGIC FIELDS	
PRIORITIES	
<p>Priority 1. Increase and internal integration of the region's innovative potential</p>	<p>Knowledge and innovation communes</p> <p>Strategic objective 1.1. Supporting changes in innovative communities strongly cooperating with knowledge and information production centres on a global scale</p>
	<p>Public service networks</p> <p>Strategic objective 1.2. Reaching perfection in the field of medical services, realized in a partnership of clinical centres, high-tech, research and innovation units of businesses, including medical and biotechnological engineering</p>
<p>Priority 2. Creating smart markets for future technologies</p>	<p>Knowledge and innovation communes</p> <p>Strategic objective 1.1. Supporting changes in innovative communities strongly cooperating with knowledge and information production centres on a global scale</p>
	<p>Public service networks</p> <p>Strategic objective 1.2. Reaching perfection in the field of medical services, realized in a partnership of clinical centres, high-tech, research and innovation units of businesses, including medical and biotechnological engineering</p>
	<p>Regional innovation ecosystem infrastructure</p> <p>Strategic objective 1.3. Network co-creation and co-usage of research infrastructure by academic entities, universities, businesses and public utility institutions</p>
	<p>SME in global economy chains</p> <p>Strategic objective 1.4. Internationalization of SME sector via specialization of innovation support institutions' services</p>
	<p>Talents and competences</p> <p>Strategic objective 1.5. Multiplication of knowledge, skills and competence of entities creating the innovation ecosystem</p>
	<p>Knowledge and innovation communes</p> <p>Strategic objective 2.1. Co-creation of competence centre network for the development of smart markets</p>
	<p>Public service networks</p> <p>Strategic objective 2.2. Raising the quality of public service network, using digitalization, especially in the medical public administration and education sectors</p>
	<p>Regional innovation ecosystem infrastructure</p> <p>Strategic objective 2.3. Construction of a new infrastructure of smart growth, based of low-emission technologies and energy efficiency</p>
	<p>SME in global economy chains</p> <p>Strategic objective 2.4. High level of participation of SME sector businesses in regional and meta-regional cooperation networks, increasing its participation in smart markets</p>
	<p>Talents and competences</p> <p>Strategic objective 2.5. Strengthening the activity of prosumer groups</p>

2.3. Priority 1. Increase and internal integration of the region's innovative potential – description of strategy objectives

Strategic objective 1.1. Supporting change in innovative communities strongly cooperating with knowledge and information production centres on a global scale

Today in the global economy of knowledge, the way of treating innovative communities and propelling their development is changing. Equally important as territorial bonds are global bonds. Building competitive advantage is born out not only by the ability to configure resources in the region, but also the ability to aptly make use of the resources available beyond the region's borders. In this aspect the access to knowledge and information resources becomes particularly important. This pertains both to the sphere of research and implementation, and to business making.

In a situation whereby the Middle-Eastern European countries cease to be the places on the global map where comparative advantages are gained, it is important for regions such as the Śląskie Voivodeship not to stuck in the trap of 'being half way' between regions of mass industrial production and highly innovative regions basing their economic transfers on intellectual property-related transactions. Therefrom results the need to build new kind of global scale strategic alliances, under which innovative communities of the region will enter world-level scientific and industrial relations, thus balancing their endo- and exogenous development potential.

The Śląskie Voivodeship has long been regarded as a region of huge innovative potential. The large number of academic institution and an extensive industrial background create good conditions for the forming and diffusion of innovation. In the recent years, together with the gradual financing of restructuration processes on large industry and the conversion in the mode of organizing public services, innovative communities emerged in the region which, drawing upon the previous experiences or market position, dynamically began to position themselves in domestic or international arrangements. They are related with both traditional branches such as mining industry, energetics or metallurgy, and chemistry, environmental protection, automotive production, logistics and medicine. What also matters is significant interest of the region, including BIZ, although the level of embeddedness of companies, located in the region by foreign investors is highly diverse.

Realization of the objective was to a large extent dependent on the openness of the above mentioned communities to international cooperation. Without the will to not even maintain, but to create global bonds: common projects or shared processes it will not be possible to gain leadership in a meta-national scale. Regional entities are currently valued partners in many activities within international arrangements. This pertains in particular to universities and research institutes. However in the situation where the public sector is increasingly cutting its expenses for grants and other similar policy instruments for the sake of gaining funds from the market, readiness for participation – including financial – in international consortia is a kind of investment for the future.

Equally important is for the innovative communities to define their strategic orientation region in the scope of participation in global nets. In this aspect the following approaches should be identified:

- creating means of technological perfection of international reputation in the region;
- participating in global alliances, characterized by unique knowledge;
- cooperating with global nodal knowledge and information centres as subcontractors in narrowly specified scopes and
- using resources and experience of world's knowledge and information centres in order to cover the distance by means of imitation of transfer the so-called good practices.

In fact, each of those orientations requires a different type of material and human capital involvement as well as a different kind of building network relations. As a consequence, there will also appear a necessity to diversity policy instruments related to supporting particular communities.

A key aspect for the realization of the objective is the activation of human resources and reorientation of financial resources' allocation. In the scope of human resources the scientific and research institution as well as the voivodeship's innovative companies have personalities – leaders, whose experience, competence and achievements allow for entering international cooperation networks; they also have staff resources of young people, ready for internationalizing their activity and quickly gaining competence in this scope. Simultaneously in this aspect often a sort of "middle generation" gap is underlined: the lack of people who could perform low-grade executive functions and at the same time be authorities for many people in their field.

Financial resource allocation reorientation is related with the above mentioned treating of participation in world networks and consortia as an investment in the future. On the one hand, this means readiness for engaging one's own means (not only grants) into activity related with internationalization. On the other hand, thinking in this aspect opens new horizons in the scope of planning infrastructure development. In the era of network infrastructure and large data transfer possibilities a common planning of investments within network and infrastructure sharing. This enables to increase the effectiveness of the investments made in micro-scale, and in network scale – to spend saved means on, for instance, dynamization of internationalization or strengthening of network integration.

A risk to account for when dynamizing external network relationships is the possibility of "flushing" the resources out of the region, in particular human resources draining. There is also the risk of emerging such a strong orientation on international objective, a 'mingling' of sort in various groups, that gradually the endogenous basis of the functioning of a given society are neglected and in consequence it begins to lose its position in external relations.

In the perspective of realizing a goal important are: strengthening the international potential of regional innovation ecosystem's actors, inclusion of regional entities into world technology markets and creation of technological perfection poles.

Strengthening the international potential of regional innovation ecosystem's actors is mostly related to supporting the participation of regional institutions in different international cooperation networks. Such support may take the form of financial means, but also of mediation in making contacts, creating patronage and image systems etc. It is also connected to the active role of the region's public authorities in public and public-private projects, e.g. in the informative aspect, involving representatives on project works, receiving visits from representatives of international networks and projects.

The essence of creating technological perfection poles is the fulfilment of the region's aspirations, so as to become a recognizable research, implementation and technological business centre on a global scale in several fields of technology utilization. Activity related to the realization of this direction do not have to be strictly related to research or implementation works. Equally important are image aspects cohesion of message, readiness of authorities to invest in pilot and demonstrative installations, creating the place's atmosphere.

The thematic fields of the region that are in a way 'predisposed' in this scope are medicine and power industry. Besides the current realization of new culture infrastructure and the social movement that has emerged in connection to the European Capital of Culture status conferred to Katowice, as well as design-related issues, the so-called culture industries appear to be the third important thematic field.

Strategic objective 1.2. Reaching perfection in the field of medical services, realized in a partnership of clinical centres, high-technology, research and innovation units of businesses, including medical and biotechnological engineering

The past 30 years of public services development on the premises of the present Śląskie Voivodeship is irrevocably associated in Poland with dynamic development of medical environments. In that time at least several important clinics and hospitals providing specialist medical services - often unique - were founded and gained a stable position in the region. The development of treatment methods and techniques was always accompanied by intense research works related to key medical issues. With the strengthening of scientific and clinical position of Śląskie medical communities, hospitals developed institutes working on medical engineering and biotechnologies. At present the Śląskie Voivodeship, and in particular the Upper-Śląskie Agglomeration, constitute a kind of perfection centre on at least country scale in, for instance: cardiology, oncology, orthopaedics, traumatology, burn treatment.

From the perspective of the region's innovative development, it is important to support synergy between the existing clinical background and the network of scientific institutions and research-and-implementation institutes as well as companies in the medical branch that is developing around it. This naturally forming concentration of institutions becomes a 'spot' of knowledge flow regarding topics related to perspectives for the application of technologies and engineering. The region should aspire to attain significant multiplication effects in the form of both rising quality of the provided services and in the form of revenue from commercialization of the knowledge generated in the region.

The region's medical branch is specific due to the nature of research and therapeutic activity in medicine. Since thematic issues are in a way separate, the branch is typically divided into "academic schools" in the above mentioned specializations. Around those schools, on their part, in the following years there will emerge *spin-off* businesses, foundations, small research and technological parks. This means, on the one hand, a huge potential for creating and positioning a regional product names "medicine". On the other hand, however, it involves the risk of internal rivalry for means and various types of conveniences, granted by public authorities by broadly understood "medicine".

The interplay in systematic and ownership-related conditions of health care is highly important from the perspective of organization of providing medical services. From the systemic point of view, the quality of provided services - including technological advancement - is strongly dependent on funds allocation, performed by the National Health Fund and entities of the open market of medical services. However, from the ownership point of view, hospitals' founding bodies play an important part. In this scope, in the region both local governments (mostly that of the Śląskie Voivodeship) and the Śląskie Medical University play an important role. Further technological development of medical services in the region to a large extent depends on the size of those bodies' budgets and on the effectiveness-related procedures they apply.

From the branch's technological development in the region perspective, a key part will be played by the ease with which medical, medical engineering and the broadly understood *life science* communities are able to participate in international R&D networks, as well as by the access to capital for research infrastructure, intellectual property operation and conducting pilot projects. In this aspect it should be kept in mind that, just like the whole *life science* and medical engineering sector in the world, also in the conditions of the Śląskie Voivodeship medicine remains under strict observation of world-level players. Many activities realized in this field enable quick profits from commercialization, but also in a large scale, lost benefits due to improperly pursued intellectual property policy.

As was signalled above, in the region's medical communities subsequent generations of specialists in particular branches were raised, which means that the key resource which are specialist doctors, researchers and engineers in the broadly understood *life science* field and medical engineering, is available in the region. Employment in this sector is still prestigious and generated an influx of applicants for studies in related fields. It provides a basis to assume not as much the necessity to "generate" staff but the need to create set of tools of policy that would facilitate their development.

Another important resource field are financial means, In this aspect a differentiation should be made between regional intervention into the health services financing mechanism (NFZ - the National Health Fund) and financing investment and support/motivation instruments, in the competence of public authorities as well as public and private institutions.

In the investment aspect it is important for the sector to maintain infrastructural resources on such a reference level as would allow for participation in international scientific and research-and-development projects . In the international scale technical background is just as important an element of building advantage as staff perfection. Only by having infrastructural solutions relevant to the present state of the art enables to overcome barriers of entering into global scientific-research networks.

The financial means from the market or from private investors can be rather gained for incubation or for re-propelling small technological businesses that are founded around large clinical centres. In this aspect a relatively significant level of interest in the *life science* and medical engineering sector appears to be a chance for the region.

A risk to be taken into consideration in while realizing the objective is the possibility of becoming overly oriented on health care only. The strength of medicine generates the medical sector in the region; however, for the region's innovative development it is most important to consolidate the research and implementation aspect and to strengthen the relation between clinical and high- technology medical engineering enterprises with *life science*.

Another important risk area is high dependence of the sector from public funds, or from the financing from either NFZ or public owners/founders. The specifics of financing the newly created innovative companies with participating high-risk funds entails the already mentioned risks connected with intellectual property transactions.

An unusual, and yet existent risk area is the activity of a specific evaluation factor for the "effectiveness" of spending the funds of local governments. Namely, a painful issue for the local governments might be the fact that the means invested in the regional specialist centres serve the benefit of not only the inhabitants of the region, but also people from outside the region, who come to the Śląskie Voivodeship for specialist treatment.

In view of the above stated, actions important for realization of the objective are: creating a support system for international activity of doctors and communities related with *life science* and medical engineering, investing in an infrastructure that would reflect the contemporary state of technology, and also drawing private investments into innovative businesses in the *life science* and medical engineering sector.

Creating an international activity support system involves activating grant systems, internship programmes etc. This pertains both to persons leaving the region and to persons coming to the

region. Support of this kind may be provided for specific scientific and research-and-implementation topics, "ordered" by the region, and as complementary form of support to large projects, e.g. EU frame programme projects or other important international agreements.

Investing in infrastructure bears the idea of concentration of financial means of different public money administrators including local governments, for constantly strengthening (apart from a stable, modern arrangement securing health care possibilities for the region's inhabitants) reference infrastructure resources allowing to conduct research with results accepted thanks to the quality of equipment and conditions wherein they are conducted.

Attracting private investments is related to generation of positive message about the potential and perspectives in the medical branch in the region. This message should be accompanied by specific support instruments for a potential investor for the one part, and for entities or individual originators from the region, who have significant medical or technical knowledge, but unaware of issues related to measurement and commercialization of intellectual property.

Strategic objective 1.3. Network coo-creation and co-usage of research infrastructure by academic entities, universities, businesses and public utility institutions

The realization of intentions related to the creation of knowledge areas, regional innovation ecosystems, regional specializations etc. is not possible without conducting academic research - both basic and applied. It is therein that the source of implementation activity of key importance for innovativeness is found. Conducting research allows a well-based approach towards staff training and builds civilization identity of the region. Having a strong research base ensures a lasting ability to maintain novelties, whereby it enables the creation and implementation of innovative solutions in the economy. Regions that do not care about research development are doomed for functioning in an unstable situation of technical solutions' "broker" - entities operating there dependent on purchasing technologies which, after a slight conversion, can be distributed on internal and external markets. This hampers their ability to generate high added value and makes their development trajectories strongly dependent from the behaviours of other global market players.

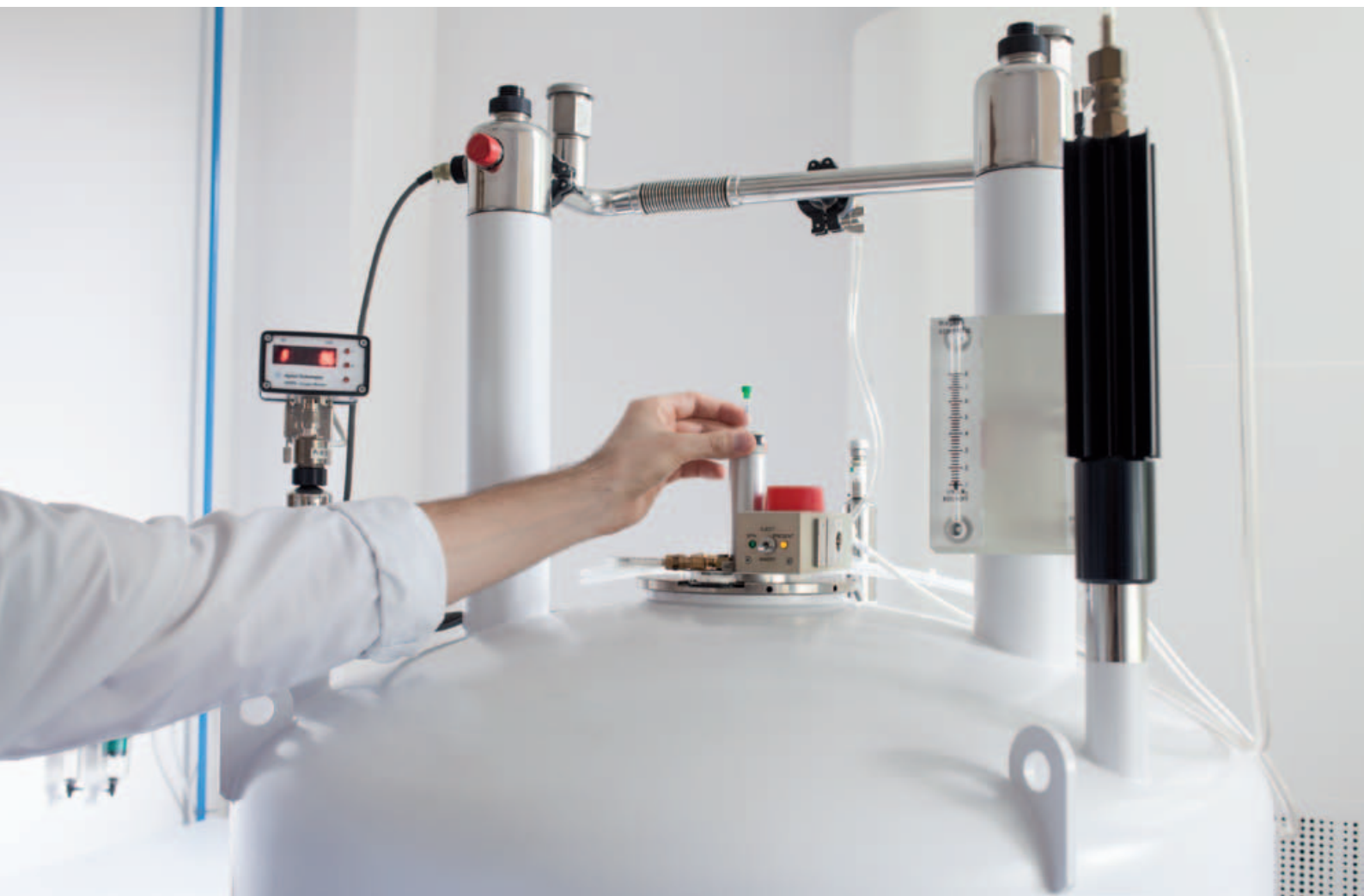
Simultaneously, having a research infrastructure allowing conducting research on the so-called world level requires ever more investment means and ever better coordination of works in order to achieve full workload on the installed equipment. In a region such as the Śląskie Voivodeship, having a rich institutional background in the field of science, it is easy to attain negative purchase doubling effects and a mutual "cannibalising" of region-initiated projects, applications for the financing of which are submitted to country and international agendas. In this aspect it is desirable to undertake the following in the region: common "low-threshold" activities regarding better information about the possibilities to make use of the already installed infrastructure and common investment enterprises, directed for the creation of shared fundamental research infrastructure.

Conducting activities referred to as "low-threshold" already has a history in the region. Works in this scope are conducted both by the research institutions themselves as by business environment institutions that pursue regional, country-wide and international technology transfer support projects. It is relatively easy to benefit from the results of such works, since it requires only the actualization of the gathered data, or in some cases creating a better system for gathering, actualizing and sharing the data. Apart from technological aspects of the operation of such a system, interest in its operation must be also expressed by infrastructure administrators and research team leaders, interested in purchasing or barter exchange

of selected services. In other words, the source of success should be sought for in the involvement of universities, departments and institutions managing staff as well as in entrepreneurial behaviours of research projects' managers.

The realization of common investment activities - apart from the undoubted need to overcome mental barrier - requires the development of informal standards, procedures, good practices in the region. This is related to the fact that most of those activities will be conducted in the public sector or at the crossing point between public and private sector. In practice this means the necessity to apply tightened legal regulations regarding public finances and to solve more complicated fiscal and public aid issues than in the private sector. It should be also noted that some paths of conduct have already been verified in practice: during the creation of advanced technology centres, in the process of realizing common projects financed from external sources and in consolidation processes in the research institutes sector. Simultaneously also the first non-public initiatives emerged under which research equipment is being installed, used for shared projects with universities or research institutes.

Realization of this objective is strongly conditioned by external financial transfers, because they are the main condition for the expansion of fundamental research infrastructure. In the scope of public funding there are two contrary trends. On the one hand both in the state and EU policy a growing importance of science financing is underlines. On the other hand, the budget situation of European countries is currently highly unstable, which undoubtedly influences the willingness to spend public funds on strategic and long-term undertakings. Higher level of involvement of the business sector is meant to be the answer for a relative decrease in the role of the public sector. It should be underlined however, that this sort of financing appears in countries and regions where wealthy companies are settled in strong economy, mostly during prosperous periods. In this situation an important issue is the willingness of



universities and research institutes to finance the development of research infrastructure in consortium arrangements from their own means, using financial market's instruments. Also, the role of the Śląskie Voivodeship's development policy instruments is expressed in this scope.

A risk to be taken into consideration when creating solutions related to co-creation and sharing of fundamental research infrastructure is firstly the possibility of internal movements in research bodies that would negate, hamper or render impossible the realization of common infrastructure projects. Such attitudes might arise not only as a result of the willingness to have their own infrastructure, but also due to fears regarding the form of the future shared resources management system. The aspects of losing influence or lack of coordination seem very important in this aspect. Another risk area is strong dependence from external financing. It hampers long-term investment planning.

The realization of this objective will be made possible by creating consortia, realizing common infrastructural projects and creating projects teams in consortium arrangements.

Common infrastructure projects denote shared investments and mutual management of material infrastructure for conducting fundamental research by at least two public institutions or within public-private partnership. The first projects of this sort are already being realized in the region. Apart from the engagement of consortium members, such activities should be treated as of priority meaning when making decisions about the allocation of given public funds, and also in the area of regional authorities intervention. It is important to secure the stability of operation of a common enterprise. The realisation of the investment itself is simpler than the later financial and managerial securing of its further effective and efficient operation. Especially in a situation when fundamental research are discussed, it might be worth considering to create a financial mechanism partially minimising the risk described.

Creating project teams in consortium arrangements is not a new question in the region. With such a large number of research centres that already conduct research, inter-institutional cooperation has already become a standard of sort in the Śląskie Voivodeship. Particular attention should be paid to ensuring that the future projects are generated for making use of the complementary infrastructure existing in different institutions and that investment planning of particular entities be performed jointly with planning research under projects realized by several institutions. This will allow for reaching a specific portfolio of key equipment in the region.

Strategic objective 1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services

The internationalization of small and medium enterprises operations is both the fact and still a development challenge for this sector in the Śląskie Voivodeship. Operation on international markets, entering into international supply chains and value chains have become exercised by many companies in the region. At the same time concluding international transactions is a challenge for the SME sector due to, among other things, lack of competence, not always recognized legal and fiscal conditions of intra-community transactions and expectations of too high outlay for winning markets in comparison with the forecast revenue. Minimizing those sources of uncertainty is an important domain of business environment institutions which, operating in international networks, are able to transfer knowledge to local business communities.

The way of providing support in the field of internationalization of SME can have a tripartite formula - or horizontal support, thematic support and preparation for commencing capital relations in an

international scale. In the horizontal formula those actions acquire an aspect that is similar to the activities offered within the functioning of the *Enterprise Europe Network*, which means that they are focused on access to knowledge, including non-profiled databases and activation of international cooperation, also by means of conducting training in international competence. The thematic formula is more appropriate for institutions which manage cluster initiatives or cooperation networks. It is connected with the concentration on thematic issues characteristic for the selected value chains, building *b2b* relations in their scope and providing profiled advisory issue. The formula of preparation for commencing capital relations is connected with preparing companies from the region for additional capitalization by external investors and conducting programmes of matching potential global investors with promising business enterprises in the region.

In the Śląskie Voivodeship a range of institutions function that are aiming at supporting innovativeness. Those are business-related institutions, but also economic local governments, associations and sealed technology transfer centres. They have the experience, references and function in international cooperation networks, as well as build local relations with field experts. This is why they are able to quickly generate new elements of support offer for small and medium enterprises. Strategic orientation of innovativeness support institutions for the internationalization of SME is then rather connected with the achieving of consensus in the matter of mode of conduct that with the necessity to expand competence or infrastructure in a significant way.

An important condition - which influences not only the cooperation of institutions, but on the shape of the offer they create together - is the changing mode of operation on international markets. Apart from legal and financial advice, access to databases and generating *b2b* relations there should appear modules related to contemporary transaction systems, relations marketing, communities - also the virtual ones, prosumerism etc. In the same way as the instrumental layer of acting on world markets is changing, the offer of innovativeness support institutions will have to be changing as well.

In the aspect of building capital relations, important conditions are both demand - the readiness of businesses to change their ownership structure in order to gain additional means for development, and also supply - related with the fact that the innovativeness-support oriented institutions are lacking experience in the area of broker enterprises in this scope.

Resources that condition the implementation of the objective include: workers and experts of innovativeness support institutions and financial resources allowing to generate support offer. As was already mentioned, with time - thanks to the participation in various EU initiatives, the staff of innovativeness support institutions have significantly developed their competence. Then, thanks to the cooperation with field experts, it is possible to supply specific knowledge for specified economic processes. In this aspect there is no need in the region to "build from scratch" but to systematically strengthen the existing resources. The only exception is the aspect of creating capital relations. The creation of offer in this respect has to be started almost "from scratch" - both in the awareness-building in SME aspect and in the aspect of preparing the staff of innovativeness support institutions and them entering into network relations, which enable them to effectively negotiate with investors.

In the financial aspect it would be impossible to generate the hitherto offer in the present scale without external support - most importantly the programmes financed and co-financed from the funds of the European Union. This extensive offer of support services for SME that are provided free of charge or for preferential prices made the market of advisory services in similar scope practically vanish. This means that the system created in the region will have to - at least in the first years - be based upon financing from other sources than the interested businesses, i.e. on public funds.

The risk to be taken into consideration in the processes of innovativeness support institutions consensus consolidation in the Śląskie Voivodeship for the internationalization of SME is the strong dependency of financial liquidity of those institutions from current involvement in co-finances (fully financed) projects granted under competition procedures. Despite the lack of provisions made, this can make the institutions strongly compete at the same time, among themselves, for every possible kind of projects, which would ensure the financing of institutional activity in following months and years.

The sole thinking in the categories of "next projects" is also an element of risk. It is so, because in their inertia institutions often begin to live "from one project to another", focusing on particular goals and project indicators, not combining them into complex offers, ensuring the possibility to generate long-term cooperation paths with key customers.

From the regional policy perspective, aimed at internationalizing the region in the economic dimension, it is crucial to initiate international connections and to increase competence of international region inhabitants in the scope in professional cooperation.

Initiating international connections among companies in the region is the strengthening of the existing enterprises aimed at the promotion of export, building international *b2b* relations, study visits, advisory services in the scope of commercial law in other countries etc. At the present stage implementation of instrument tools of this sort requires breaking a mental barrier, which would enable to make subsequent circles of entrepreneurs join the beneficiaries of such activity. In other words, what is necessary is not as much a change of policy instruments, as involvement of new target groups and a lasting change of awareness with regard to the creation of international relations. A separate issue is the already mentioned willingness to build investor relations on an international scale. Activities related to this appear to be a new niche in the regional innovation system.

Increasing international competence of region's inhabitants relates to culture and language skills connected with professional life in international groups or partner arrangements between companies from two different countries. It is an area of soft instruments' intervention, connected with the new understanding of adaptability on the labour market. The essence of this direction is to increase the openness of workers or future workers to international cooperation. Activities should be then aimed at both persons employed and current students (at academic and school level). Those will allow us to strengthen businesses in the region, since due to extended competence the workers will be more apt at operating in international business relations and creating new value chains.

Strategic objective 1.5. Multiplication of knowledge, skills and competence of entities creating the innovation ecosystem

The search for the ideal reflection of the current state of economy in the education system has been the subject of numerous debates since many years. It is known from practice that elasticity in this regard can be significant, given a considerable dose of involvement on the part of business and education communities. Still, it has to be remembered that usually the reaction for current phenomena in economy includes actions in the area of education and lifelong learning. In this way, there is always a gap of maladjustment, resulting from continuous dynamic changes in the markets, and in consequence - in businesses. The essence of realizing the adopted objective is to link development processes in companies with the labour market and education sector in such a way that would enable a possibly quick, and in some aspect even advanced, reaction to those dynamic changes.

The realization of the so understood objective comprises at least:

- issues related to major courses characterized by an appropriate dose of theoretical and sectional contents, enabling to educate a graduate with good basic knowledge, ready to accomplish specialised educational courses;
- issues related to elastic approach towards designing specialized didactic paths and special programs for students in their final years of studies, which is the first step of a student's vocational training;
- similar issues on the level of technical high schools;
- issues related to profession or future competence foresights, which form an intellectual supply for education programming in the region;
- issues of regional institutional critical mass and willingness to quickly start interdisciplinary courses and postgraduate studies, ordered by business communities;
- issues related to life-long shaping of interpersonal skills, which define the ability and willingness to cooperate, beginning from issues regarding trust and teamwork through to presentation techniques, modern communication or moderating work in a group.

Achieving the goal is to a large extent conditioned by legal regulations on the education system. Maintaining the frames, imposed by education standards, often contradicts the needs, specified in subregional and regional debates devoted to spheres of economy and education. Therefore, results might be easiest achieved in the area of specialised courses - those which are not subject to governmental regulations.

It is also important to make efforts towards breaking the deadlock whereby in the education sector - higher education in particular - offer actualization lasts relatively long, and moreover, stress is put on balancing theoretical and practical questions, or even on prevalence of theory. While business communities expect quick solutions and a graduate who might not have vocational adaptation ability, but is ready to undertake work without virtually any additional training on the specific post by the employer. Actually, functioning in neither of those logics brings any result in the view of the presumed aim. Therefore, distinction should be made between cooperation of businesses for academic education paths, realized together with universities, and cooperation between companies and institutions-service providers in the field of vocational training and long-life learning for conducting vocational courses, e.g. within cluster initiatives or local thematic groups.

From the perspective of achieving the goal, it is important to build awareness in the region about the needs concerning not the identification - as it is now - deficit professions, but the identification of future professions and competence profiles. This plot can be expanded both in aspect long-term changes of the future economic profile of the region and sub-regions, and in the aspect of short-term changes. The debate about short-term processes has a significant practical dimension and therefore can be regarded as useful also by the pragmatic business communities. This may pertain to the investments, planned for the upcoming years in the following aspects:

- development of the existing plants and the related workplaces, or
- change of processes and technological lines and the related new competences and vocational profiles.

In the Śląskie Voivodeship universities, high schools and other educational facilities function whose experience and staff ensure the possibility to realize the objective. It should be noted, however, that in many cases, when programming activities, in the first place the sub-regional relations between actors from educational and business communities should be assumed that the reference configuration.

A particular risk area related to the realization of the presumed objective is that the essence of realizing it as a participation process is not understood. Tendencies to ascribe roles such as:

- employment agencies should monitor labour market,
- businesses should create stable workplaces and communicate their needs in the scope of future employment,
- universities and schools should adjust programs,

lead to a spiral of ineffective, mutually uncorrelated undertakings. Adopting a common perspective for a whole ecosystem as well as knowledge and strategic fares by all its participants is a gravity point in risk minimization.

What is important in the strategic horizon for the region are lasting processes of strengthening the ability of entities in the region to profile life-long learning and conduct regional foresight of vocational skills and competences.

In the scope of strengthening the ability of entities in the region to profile life-long learning it is worth pointing to the potential of sub-regional economic communities who, in their debates and within the projects they realize, often approach issues related to the labour market. Those forums should become the first place to design new educational solutions, with the assumption that all partners are able to quickly and precisely develop skills and competences profiles; business is ready to receive a part of the financial risk and declare a measurable demand for educational services; educational system institutions can quickly prepare education paths based on state of the art knowledge in the field. Local governments should become program partners in the local scale. In the case of programs which are wider in scope, the local and sub-regional partnerships can be strengthened with participation of regional authorities.

What should become the idea of regional skills and competences foresight is reaching such state of public debate in the region regarding the shape and profile of high-school and university education, which will enable better design or dynamic actualization of education programs realized in high schools and on universities. Significant participants in the realization of various activities under the so defined direction are the institutions of local commercial authorities, business associations, academic communities, teachers' communities, local and regional authorities. This process should be repeatable and involve a learning aspect. This is not about creating a package of reports, but about constantly forecasting future trends and phenomena, combined with the evaluation of future current actions.

2.4. Priority 2. Creating smart markets for future technologies

Strategic objective 2.1. Co-creation of competence centre network for the development of smart markets

According to the assumptions of operation of competence centres in the world their role is being underlined in building long-term cooperation in the field of research, technology, development and innovation among academic circles, industrial community, public sector and civic society. Those aim at diminishing the gap between the ability to create ideas and the ability to implement as well as commercialize them. The activity of centres offer a wide range of: gathering knowledge, concentrate infrastructure, create new knowledge by conducting various research (pre-competition and competition), trainings and knowledge dissemination into target groups.

In the recent years the notion of competence centres has been drawing increased attention, since centres of this type are perceived in Europe as an important instrument of minimizing the gap between the continent's leading role in scientific achievements and highly qualified human capital, which to a large extent does not contribute to the conversion of scientific solutions into market innovation of new generation. Since competence centres constitute a common environment for the worlds of science and industry, one should undertake specific actions for knowledge transfer and gaining key skills. As the recommendations from COMPERA project (*Competence Research Centre Programmes in Europe*, EU 2007) indicate, it is expected from competence centres to develop strategies which would be better oriented for better usage of research outcome (e.g. intensifying activity in the scope of new products and services, talents search, active support for commercialization processes etc.).

The issue of creating competence centres is dedicated to the development of smart markets and the realization of Technology Development Programme of the Śląskie Voivodeship, beginning from objects and systems such as: smart buildings, smart transportation systems, health care information networks, digital technologies for direction and supervision of providing public services, environment protection, ensuring security to the inhabitants up to a complex of interactive systems and instruments of public services management such as smart city. The observed objective and subjective development of interactive systems, objects and active market actors is a premise to describe this sort of spaces as smart markets.

References to the shaping of key competences might be found both in documents regarding the development of education and training system (e.g. The White Paper on Education and Training or National Qualification Framework) as well as Innovation and Efficiency Strategy for the years 2011-2020 Economy "Dynamic Poland" Warsaw 2011 („Dynamiczna Polska”). A continuation of ideas included in them leads to the idea of creating a network of competence centres in the region (knowledge and support anchors) based in the idea of building a coherent platform of institutions and links for the development of smart markets and the realization of Technology Development Programme of the Śląskie Voivodeship. This is connected with the indication or creation of key centres such as:

- scientific and development competence centres (NBCK),
- functional and operative competence centres (FOCK).

NBCK are organisational entities or networks of entities (universities, research units etc.) consisting of academics, analysts, field experts who, by becoming a key (distinguished) link among science, business and local governments, will be responsible for the realization of such tasks as: world trends analysis in the context of specializations realized; preparing innovative projects related to the development of smart markets; acquisition and development of talents in the investigated area; meritorious coordination of key projects connected with smart markets development; preparing staff; training and development of competence in the scope of smart markets development.

FOCK are organisational entities or networks of entities (scientific and technological parks, transfer centres etc.) concentrating field experts, responsible for the implementation of and coordinating innovative projects, realized for the development of smart markets. A feature of those markets is the focus on: technology commercialization; innovation financing; support for activities networking enterprises associated with smart markets development; meritorious support of single enterprises in the area of smart markets; observation and analysis of smart markets development in the selected specializations.

Institutions of this sort together can create a knowledge management system in the region in the area of smart markets; which is a competence centres cooperation platform. This platform will become one of the subsystems of innovation ecosystem in the region.

In the Śląskie Voivodeship there are number of research institutions which could become such "anchors", i.e. organizations driving regional development through creating global cooperation networks, thus enabling flow of knowledge, people and competence among particular countries. In this way they are the actors of the present modern economy. Their growing importance in the global dimension indicates that when investigating their nature one should not focus only on the local interconnections (for instance within clusters or among local companies) but take a wider look on the problem, investigating the relations and interconnections on multiple levels and internationally. In effect, competence centres and the network of interconnections among them should become an important mechanism supporting smart markets development. The existing extensive network of innovativeness and entrepreneurship centres in the region should be the basis for building such network.

In the Śląskie Voivodeship the activity of those research entities is focused around such sectors as: environmental conservation, power industry, automatics and electronic, construction, medical market. The same kind of specialization can be distinguished among innovation and entrepreneurship centres. In the region focus should be on several competences, which will play the role of competence centres responsible for smart markets development. Appointment or creation of sector and/or specialized and/or thematic competence centres seems of key importance for the development of regional economy.

Resources which serve as vehicles for realization of this objective are:

- human resources - development of own resources via training, selection, cooperation and exchange with universities and research units worldwide;
- knowledge resources - creating a database about global resources and knowledge;
- infrastructure resources - optimization of the application of the hitherto resources and rational creation of new ones, especially taking into account laboratory basis and *living lab*;
- financial resources - systemic, objective-related and contest projects related to the realization of enterprises for smart markets development;
- technological resources - selection of specific specializations compliant with development areas of the Śląskie Voivodeship, determining smart markets development.

Also competence development is important based on international cooperation and global knowledge resources; search and perfection of talents through wide-scale supporting young researchers and talented persons (stipends, travels abroad etc.).

In the scope of building relations the key issues are:

- shaping lasting networks of competence centres responsible for activities for smart markets development.
- designing mechanisms for evaluation of the activity of the centres in the context of realization of key projects;
- creating an inter-centre cooperation platform, particularly in complementary and implementation areas.

Basic risks related with the realization of an objective are related with a way of financing the centres (objective and/or contest projects). There is a possibility for strong competition for a designated competence centre. In certain situations the entities can restrict to local resources, not especially caring about being familiar with global knowledge resources. Also characteristic is the risk of a possible omission of businesses as key anchors for smart markets development.

Key activity groups aimed at achieving an aim are related to:

- mapping knowledge in the area of smart markets;

- developing the rules of competence centres operation - concentration and specialization processes of competence centres;
- specifying and/or creating competence centres (NBCK, FOCK);
- developing road maps for creating competence centres networks;
- developing centres networking model;
- developing knowledge management system for smart markets development..

Such activities should have a global character, the centres should be based on development of their own resources and according to the concept formulated by C. K. Prahalad and M. S. Krishnan (R=G - resources become global) create knowledge based on global resources. But resources that are in the region should be indicated, which is indicated by the following data:

- 135 research and development institutions are operating in the Śląskie Voivodeship, employing ca. 6600 people. In the country scale the region of Silesia is the second for the number of R&D entities, following the Masovian Voivodeship, which bears witness to the large research potential of the region. In the Śląskie Voivodeship the level of R&D expressed in % of GDP spending is low, while according to the Central Statistical Office 421.4 million is devoted to current spending and 165.7 million - for investment and fixed assets (see *Badanie wpływu inwestycji w innowacje na konkurencyjność przedsiębiorstw / sektora MŚP w województwie śląskim. Raport końcowy*, Katowice 2010, s. 104);
- currently in the Śląskie Voivodeship the number of innovation and entrepreneurship centres is largest in the country: 88 (total in Poland is 735) including, among others 8 technological parks (including: 2 on the start-up stage and 3 in the preparation stage) technology incubators, 7 pre-incubators and academic entrepreneurship incubators, 11 entrepreneurship incubators and 6 technology transfer centres, 4 centres coordinating polish technology platforms. The Śląskie Voivodeship is one of the largest research centres in the country (3rd position in the country) (see: *Ośrodki innowacji i przedsiębiorczości w Polsce. Raport 2010*, K. Matusiak (red.), Warszawa 2010.).

It is assumed the centres have a large level of autonomy in specifying their own strategies and actions, but the extent to which their activities are supported will depend on the influence in the region's development. It is expected from the centres that they will develop demand strategies, i.e. strategies for better application of the research outcome. As world examples indicate, the main aims of the competence centres for NBCK are the following:

- increasing the ability of businesses to implement innovation via financing research conducted in strict cooperation among the research-conducting companies and recognized research groups;
- research for increasing the region's attractiveness as a smart markets-oriented place;
- supporting research clusters' development (knowledge clusters) which are among the leading researches for smart markets development;
- strengthening researcher education in the fields important for smart markets development..

For FOCK:

- supporting commercialization processes and innovation implementation processes by companies and networks of companies;
- supporting cooperation networks and technological clusters, developed in the area of smart markets.

The main rules of operation of the centres are based on:

- resources and abilities - a competence centre must gather such resources around it that would ensure it a leader position in its field in the region, make it a significant in the country and recognized on the international market. According to the R=G rule, it is necessary to pluck up power for cooperation with bodies on an international scale;

- identity - A model of the centre's cooperation with other centres and everyone concerned should be based on the image and brand of the centre in its environment. Centre's participation in all kind of scientific, research, research and practical consortia, research and industry boards, steering committees signifies the willingness of the surrounding community to support the centre in realizing its strategic assumptions;
- creditability - A centre should be perceived as an institution which by its renown guarantees top level reliability and knowledge. A competence centre must prove to the external entities that it is operating in compliance with international standards and basing on the current state of knowledge;
- permanence - It should be characterized by permanence of structure, access to knowledge, to experts, continuity of financing;
- competitiveness of offer - The ability to generate solutions according to the best, currently available knowledge, accuracy in defining the way to achieve proper outcome of research, speed and transparency;
- reaction with the environment - Clearly stated messages aimed at particular target groups will make the centre perceived by the environment in a specific way.

Strategic objective 2.2. Raising the quality of public service network, using digitalization, especially in the medical public administration and education sectors

IT and telecommunications technologies (ICT) play a major part in the designing and implementation of commercial policy based on knowledge, the element of which is innovation system. In particular, an innovation and innovativeness activating element is digitalization, including a uniform digital market. According to the assumptions of the European Digital Agenda, quick development of digitalization constitutes one of the most important growth factors of competitiveness and innovativeness potential, and both in the regional and country scale.

ICT sector directly makes for 5% of the European GDP and its market value constitutes over EUR 660 billion yearly. At the same time, its role results from the fact that it contributes to the general growth of efficiency, 20% of which is direct activity of ICT sector and 30% are ICT investments. This results from a significant dynamic and innovativeness of the sector and its ability to influence changes in the mode of operation of other sectors, including the public services in which we are interested. Broader and more effective application of digital technologies will enable Europe, Poland and the region to face the main challenges that they are to face, not only of economic character. For the inhabitants of the region and communes this will mean a better quality of life thanks to, among other things, better health care, safer and more efficient transportation, cleaner environment, new opportunities in the field of media and an easier access to public utility services (e.g. e-administration) as well as cultural and academic contents. Bearing in mind the importance of information and communication systems for building knowledge-based economy, EU decided that the European ICT development programme (digital agenda) is one of seven leading projects of the Europe 2020 strategy. The main aim of this project is to define the areas of application as well as indicating a role for the information-communication technologies to play in socio-economic development. A condition to realize the project designs of Europe in the 2020, including, among other things, pursuing new energetic policy, is the determination of a way to apply the economic and social potential of ICT, especially Internet – an important tool of commercial and social activity: it serves for work, entertainment, communication and enables free expression and exchange of ideas.

Digitalization - dissemination and increasing implementation of it is at present a condition and an instrument for developing public services. In the regional aspect the assumed objective is justified by the Information Society Development Strategy of the Śląskie Voivodeship.

Key resources for the realization of this objective are: library resources, archive, resources, digital maps, medical records, educational documentation, public administration documents - forms, rulings, documents constituting the digitalization system in the region. The basic area of competence is the gathering, processing and electronic presentation.

The following should be regarded key actors of realization of the objective: local government units; regional development agencies; research and development units and universities, including perfection centres, advanced technology centres, technology transfer centres etc.; training and advice institutions; employers' and employees' organizations; manufacturer chambers and associations, including economic and commercial chambers etc.; entrepreneurship incubators and industrial parks; innovation support networks; advisory and consulting as well as financial institutions; health care facilities; education institutions.

Among the identified risks are the following:

- lack of uniform digital market, which hampers the realization of basic services,
- lack of established norms and standards for operating systems, which would guarantee their inter-operativeness,
- rise in cyber-crime and the risk connected with low level of trust for the network,
- lack of investments in the creation of popular access to broadband Internet,
- insufficient spending on research and innovation directed into SME sector,
- digital illiteracy and the lack of digital technology application abilities,
- the lack of legal regulations enabling the use of digitalized public resources.

For the realization of the objective it is necessary to broaden the set of public services available via Internet, increase the scale of using electronic public services by means of making granting access to the infrastructure and educating the inhabitants about the services, integration of systems and in particular in the field of education and public administration service; introducing new e-services for the inhabitants and entrepreneurs. Taking into account the instructions of the Information Society Development Strategy for the Śląskie Voivodeship in the year 2020 will be a region:

- with an image of network voivodeship, open and actively participating in the development of the global information society,
- with a popular multichannel access to information and telecommunication technologies - ICT,
- the inhabitants of which are fully aware of the possibilities created by the development of ICT and which have the knowledge and skills necessary to use the potential created within information society,
- which enables useful, friendly and popular e-services for the inhabitants, entrepreneurs and tourists,
- with a significant contribution of ICT sector in creating the voivodeship's income,
- which, thanks to the construction of knowledge economy and information society, achieves balanced level of development.

The increase of ability and conviction to information system development is connected with the direction in creating public services in the Śląskie Voivodeship in order to:

- allow businesses and entities to access budget world-class telecommunications infrastructure and a broad range of services, including cheap broadband Internet,
- allow every citizen to master skills necessary for living and working in information society - this is connected with the creation of conditions for life-long learning,
- make publicly available documents of public institutions using digital platforms,
- create new, intellectual technologies' and reinforce their role in political and social decision-making,

- ensure popular access to service, cooperation of programmes, services and information applications on the territory of EU,
- engage private funding in network development,
- guarantee protection of privacy and safe information flow.

In this scope numerous sector or meta-sector project emerged that aim at implementation of priority e-services, such as: Electronic Platform of Public Administration Services (ePUAP), Electronic Platform of Public Administration Services (ePUAP2), Teleinformation Network of Public Administration (STAP), Polish ID card, SIS II and VIS Central Node, Electronic Tax Declarations for Entrepreneurs (e-Deklaracje I, e-Deklaracje II), State registers (PESEL2), Field electronic platform MS, Information portal for notaries, solicitors, court executive officer and barristers, ERP class Integrated Performancebased budget development management system, On-line platform available to entrepreneurs related to services and resources of digital medical registers, Electronic gathering, analysis and disclosure of digital resources on medical occurrences, Communication Platform for SME and persons from the field of social-support, Integrated Labour Market and Social Security System (SI SYRIUSZ), Labour Supply and Demand Forecasting System (SPPP), e-Taxes (e-Podatki), Iona, Land and buildings registry system, National Register of Borders and Areas of Territorial Division of Poland (TERYT2), Georeferential database of topographic objects, Information system of public statistics, Consolidation and centralization of customs and tax systems, Central Registration and Information on Business (CEIDG), Presentation and disclosure of audio and video resources. In Silesia SEKAP - Electronic Communication System of Public Administration is intensively developed, which is an innovative project of strategic importance for the region's development, authored by commune and district local authorities of the Śląskie Voivodeship.

Further development of public services provided via electronic media is a must for an innovative region such as the Śląskie Voivodeship. Implementation of electronic public services and increasing spending on implementation of IT solutions with ensured investment funding will accelerate the development of communes and increase the region's competitiveness.

Strategic objective 2.3. Construction of a new infrastructure of smart growth, based of low-emission technologies and energy efficiency

Today's economy is a knowledge economy, and a region's competitiveness is determined by its potential in the field of ability to create knowledge on the one hand and to absorb innovation and knowledge transfer by enterprises on the other hand. Innovative activity in the region mainly concentrated on ensuring appropriate infrastructural solutions in the area of research and development. The activity is directly linked to the education process, covering all levels of education, and with development of a base of research laboratories in enterprises as well as in academic research entities. For creating an infrastructure of knowledge economy in the region, crucial are aspects of education and perfecting processes in organisations, and thus designing creative and entrepreneurial attitudes. It is necessary to create a mechanism for involving enterprises into co-deciding about the shape of research and development infrastructure, which ensures good conditions for knowledge transfer.

Activity fields should focus on the following problem groups:

- creating new knowledge economy infrastructure investments,
- restructuring the application of the existing knowledge economy infrastructure,

in the conditions of creating competence and cooperation among research groups and development of pro-innovative education system.



Creation and development of research and implementation infrastructure of smart markets requires adopting a set of values such as:

- the ability to gather such resources as would ensure leader position in one's field, the ability to quickly adapt to new events on the market, the ability to mobilize cooperating entities to get involved in years-long research programs and their ability to co-finance;
- acceptance by the environment;
- credibility and trust for a numerous group of cooperating actors;
- lasting functioning and cooperation, including access to funding, experts, intellectual property and knowledge;
- an offer that would be attractive for the market and for competitive prices.

New unique technologies are the base of knowledge economy infrastructure and they determine its development. They are also the catalyst of organisational changes and innovation. In the field of technological development the region has a significant potential, which seems undirected. There is a need to introduce programmes which, by monitoring the development of technological areas, shall ensure the creation and development of research and development infrastructure. In order to make the knowledge flow process among the actors of regional innovation system more efficient, it is necessary to design one coherent common platform available for everyone concerned. Creating databases about new research achievements, databases of good practices connected with their implementation, may evoke more coherent and intense interest in their implementation in the organisations operating in the region. A coherent knowledge exchange platform might also provide a place for creating demand for specific resources and skills. Identified demand of a region in the area of new solutions requires the creation of support instruments for the emerging projects. It then becomes important to precisely coordinate the processes of designing and developing research and implementation infrastructure for optimization of results in the context of building regional specializations.

An important condition is the increase of dynamics of spending on R&D. At present, a step-by-step increase of R&D spending is enough. A significant level of under-financing of science necessitates taking radical steps towards strengthening it and increasing its attractiveness. More involvement in financing enterprise research is necessary.

At the same time a renewal of research and staff resources will take place. Both the R&D and enterprise circles put much stress on employing high-class specialists in the fields, in which research is being conducted. At the same time new technologies are being introduced that require new knowledge and skills of workers.

The shape of R&D infrastructure will be to a significant extent determined by the real availability and ability to apply the following:

- EU programmes aimed at interdisciplinary, international cooperation;
- programmes aimed at training, knowledge increase;
- presence aimed at the cooperation between enterprises and R&D sector institutions regarding innovation implementation, technology commercialization, the presence of European platforms of: technological, researcher's cooperation, entrepreneurs.

A key condition for reaching the goal is current and future EU and domestic policy of oriented at the process of transforming to knowledge economy, which is connected with supporting such technologies as micro- and nano-electronics, photonics, bio- and nanotechnologies, new materials. It delivers a significant context of directions of infrastructure development. This is why, while choosing infrastructural

projects on the regional level, concentrated on fitting the region's specialization, not only regional conditions and potential should be taken into account, but also external tendencies.

An important context of building new infrastructure of smart growth is taking into consideration the objectives proposed under the initiative of leading strategy Europe 2020: Europe effectively using resources and European objectives related to energy and climate, the meeting of which constitutes a basis of internal energy market (the Electricity Market Directive (2009/72/EC)) Regulations, formulating the development of smart markets, assume the introduction of smart measurement systems, and further - smart networks. Smart networks are one of the methods for member states to meet the requirements in the area of promoting energetic efficiency (Directive on energy end-use efficiency and energy services (2006/32/WE)). In further perspective in the message in the Commission "Roadmap for moving to a competitive low-carbon economy in 2050" smart networks were deemed the main factor enabling the emerging of a new low-emission electricity system, increasing the efficiency on the demand side, the contribution of renewable sources and dispersed generation and enabling transport electrification.

Also important is the influence of reform package related to the sector of science and higher education; realization of interdisciplinary projects aimed at cooperation among researchers from different domains; creation and development of cooperation networks within regional innovation systems; being directed at third generation universities - putting stress on education, research, but also commercialisation of research results; building organisational structures within R&D institutions, universities, supporting innovation commercialisation processes; supporting actions aimed at enhancing the present situation regarding intellectual and industrial property protection.

Basic risks related to the realization of the objective regards the mode of financing the infrastructure, the fight for an exclusive access to the infrastructure and not enough familiarity with global knowledge resources. Key features for completing the objective are:

- investments in modern research laboratories in research and development institutions, support institutions like technological parks, competence centres and incubators;
- development and implementation on the regional level by research and development sector institutions a common approach towards knowledge transfer and commercialization;
- raising efficiency of commercialization of research results in research centres by implementation of new models and commercialization strategies, change of legal regulations, including protection of intellectual property and creating *spin-off* and *spin-out* companies;
- development of new knowledge areas and cooperation for directing activity profiles of research and development institutions;
- concentrating groups of academics, researchers and entrepreneurs around exploration areas in order to create solutions on the international scale.

It is important in this aspect to support the consolidation of research groups in the region for solving particular problems, development of new scientific specializations and optimal application of scientific potential, supporting the creation and development of integrated research institutions. This should be linked with the implementation of elastic methods, procedures for cooperation with businesses in R&D sector institutions. Another important aspect is motivating groups of academics who are outstanding not only with regard to their academic achievements, knowledge, but also in implementing knowledge in practice. Which in total means developing tools in research and development institutions, that would enable current assessment and monitoring of research results from the commercialization perspective. Complementary to those activities is cooperation in networks and clusters in which conditions arise for effective realization of technology and research results transfer and commercialization processes. Also complementary is the development of qualitatively new education models on universities (disposition

towards supporting entrepreneurship among students, creating small student groups, attaining education accreditation).

From the financial perspective growing in importance is the increase of access to sources of funding which make commercialization processes ever more efficient, i.e. business angels networks, high-risk capital, seed funds, patent funds.

Strategic objective 2.4. High level of participation of SME sector businesses in regional and meta-regional cooperation networks, increasing its participation in smart markets

Creating cooperation networks of SME groups provides a source for long-term designing of added value. Smart markets might significantly contribute to the creation of new strategy of smart, sustainable development facilitating social inclusion. Smart markets are in the forming phase, which generated a significant risk as well as space for indefiniteness for entities who want to participate in it. This context is particularly important for SME, which, due to the amount of capital they have, are not immune to this risk. SME participation in regional and meta-regional cooperation networks seems the right direction of increasing participation in smart markets with an acceptable risk level. Participation in cooperation networks will enable interdisciplinary approach and, thanks to the complementarity of partners' resources, optimisation of decision made. Participation of multiple partners will decrease financial risk. An important activity in the network cooperation will be the ability to negotiate and manage intellectual property for securing participation in economic exploitation of intellectual goods.

The striving of SME to participate in smart markets will be an important context for limiting the imitation method, common among SME. An alternative space for development will appear, related to the creation of and access to new technologies instead of purchasing them. Creating products of services that are new in the world scale makes SME participation in smart markets real.

In the region dozen clusters and cluster initiatives were identified, which face the challenges of smart markets' development. It seems justified to use this potential in the region, which in Poland is being very well-concentrated and developed. This does not mean concentration on the existing networks, the more so that the activity within creating networks should also be concentrated around large innovative companies.

A particular role in reaching the goal will be played by development and application of resources:

- human - this is foremost specialised persons, who are able to create cooperation structures, animate, coordinate and manage them - assessment of such competences in the region and indicating their development processes is very important.
- infrastructure - according to research conducted in the region, cooperation network supporting infrastructure is not lacking. However, this infrastructure can be developed by expanding laboratories and *living labs*.
- financial - an extremely important factor seems to consist in indicating funding key projects for the development of cooperation network in smart markets. The activities should not, however, be restricted to support actions - therefore it is necessary to develop mechanisms, which involve enterprises in co-financing innovative undertakings to a larger extent.
- technological - on the one hand, those are regarded as under development (e.g. lean carbon technologies, energy saving), but on the other hand the technological potential seems dispersed and disintegrated - therefore, the key support for the development of technological resources is the creation of particular specializations and striving towards the increase of critical mass with simultaneous growth of region's competitiveness and its innovation level.

Key competences of networks related to the development of smart markets is most of all specialized knowledge and knowledge related to the processes of creating, coordinating and managing of cooperation networks. Those competence should be most of all developed in all entities, which perceive cooperation as strategic development. The most important element of the structure is the creation of relevant models of cooperation and systems of communication. Support should cover actions facilitating the creation of structures, in particular taking into account the role of networks or clusters in the regional ecosystem of innovation.

The actors of objective-realization actions are most of all the existing cooperation networks and clusters as well as science business and administration community and this part of civic society who want and/or acts for the development of smart markets. The task of the region is to encourage undertaking concrete actions in this scope.

Among fundamental risks related to the realization of the objective are:

- the need to increase the involvement of entities into the financing of common initiatives;
- the large scope and lack of understanding by business community and society of problems related to the development of smart markets;
- weak involvement of SME into development processes of smart markets;
- lack of coherent policy of cooperation networks and clusters;
- weak involvement of large businesses in the cooperation processes, including mostly those under R&D;
- still weak competence (local) and trust..

Assuming that the region bases its innovative activity on the development of smart markets, the fundamental issue is to define the role of SME and include them into global industrial chains. This means that the following become the key issues:

- supporting the development of the existing cooperation networks and clusters operating in the areas of: energy saving, renewable energy sources, clean carbon, transport, IT and telecommunications, and medical technologies for their internationalization and attaining the key status on the Polish market and recognition on the world market;
- supporting networks, alliances and clusters of businesses cooperating with key entities on the smart markets; the condition for cooperation support is the common innovation and/or the passing new R&D solutions of large businesses for the sake of common dynamic development;
- incubation of networks in prospective technological directions.

It should also be stressed that the development of smart markets should be connected with the development of creative industries, in particular those combining the activities of local communities, and shape the region's identity.

In the conditions of growing deregulation, liberalization and economic transformation, small and medium-sized enterprises have to operate in a dynamically changing environment. This environment is shaped by, among other things, governmental policy regarding SME and by factors and conditions stemming from the specific nature of market economy. The basic development factor of cooperation among SME is facing competition and the requirements of Western conglomerates. Most frequently, the operation of foreign enterprises in Poland is subject to global policy, taking into account their traditional cooperative bonds, pricing policy and profits. The appearing in SME cooperation networks allows creating a large market advantage, which enables being a partner for large conglomerates. Foreign enterprises, competing with the Polish ones on the Polish market, gain competitive advantage since they have dominated distribution channels, have technological and capital predominance, better

access to financing, are able to act globally and they are the ones to determine development strategy of goods and services. By entering into cooperation with large conglomerates SME gain the opportunity to develop and strengthen their innovative potential.

In order to raise innovativeness and competitiveness of the SME sector, which is meant to participate in smart markets, it is necessary to stimulate the creation and development of cooperative bounds among enterprises as well as between enterprises and other institutions, e.g. indicated competence centres. Bounds and contacts among enterprises as well as between enterprises and other institutions in the form of cooperation networks and clusters constitute a kind of sub-system of the innovation ecosystem. The processes which are or will be realized by the networks, besides economic values, should be the basis for estimating social effects, including prosumer and innovative culture (connected with the development of science and research in the region). The effect of those works should be the creation of an appropriate infrastructure, mechanisms and tools which, by underlining the priority meaning of the solutions, will support appropriate initiatives and create conditions for initiating new activities in the area of smart markets.

A strong side of the region is the dynamics of cluster growth in the area of smart markets, and the developing cooperation culture, and still its weakness is the dispersion of those structures (they resemble project structures) and its weak position on the international ground.

A factor stimulating entering into cooperation among SME is the regional policy aimed at improving life quality in the region, supporting entrepreneurship, strengthening the image of the region as a modern, competitive and innovative centre where cooperation is initiated. For achieving this objective it is necessary:

- to stimulate the raise and development of cluster structures via creating a coherent cluster policy;
- to use SME associations and organisations in the process of networking;
- to undertake initiatives stimulating cooperation among SME and between SME and other entities - creating regional cooperation models;
- to create an experience exchange forum, meritorious support and contact between different actors of regional innovation ecosystem - creating a Regional Competence Centre for cluster development;
- to create a set of activities for internationalization of regional clusters acting for the development of smart markets;
- to enhance the operation of legal environment regulating commercial activity;
- to elaborate financial support system for clusters in the Śląskie Voivodeship;
- to better apply the available and new instruments supporting initiatives related to cooperation in the SME sector.

It is then important to pay particular attention to developing a coherent cluster policy, which will especially underline the role of clusters operating for smart markets; to indicate the assumptions of supporting large enterprises cooperating with SME network for the development of smart markets; to develop models, mechanisms and tools for supporting network enterprises for smart markets development.

Strategic objective 2.5. Strengthening the activity of prosumer groups

A prosumer is a person or an organisation which has an in-depth knowledge of products and services related to a specified brand or sector. Often this knowledge is passed on to others, including the supplier.

The prosumer has more awareness when it comes to purchase decision-making and wants to participate in active product creation. Interactions that arise between the supplier (a company) and the prosumer may be of various natures, they might create new value in much diversified ways. Also, value exchange can take place, an example of which is a prosumer who owns a local energy source - thus being power consumer and producer at the same time. Prosumer market development is a natural consequence of the necessity to cooperate on every market level: from the creation of ideas, through design, development to introducing a product to the market.

The development of prosumer groups for smart markets development is for many products connected with the development of appropriate infrastructure and implementation of modern technologies. This is the case with power media supplies, providing water and sewage services, waste management, construction of passive buildings, modern transport. Those fields require investment of field nature and very advanced ICT technologies. Both are linked with specific financial outgoings, which are obtainable since they are related to the realized European national programs in the area of infrastructure development or the development of innovative economy. Prosumer groups in fields related to, for instance, design, are of a different character. For the sole creation of prosumer groups, most important are knowledge resources, including their main source and vessel, namely human resources. Human resources in this case represent both suppliers of products, using return value from clients as well as the clients - innovative participants of labour market, who are willing, beside consumption, to enhance the product or its realization in an innovative way. An important resource supporting prosumer movement is the increase in availability and use of Internet and digitalization of economy and administration. In the case of realization of this objective the most important factor are human resources - talented and innovative people in the region are not lacking - what remains to be the challenge is their progress and developing prosumer attitudes. In order to achieve this objective, also global resources might be used, such as for instance the best practices of prosumer movement, smart measurement systems, smart power networks, projects of smart buildings, smart transport systems or cities. Increasing activity of civic society will also result in using prosumers in education and training services and in culture.

Target area of activity of creating prosumer groups for smart markets development should be those areas of commercial and social life where innovation is playing an especially big part. Actually, this pertains to all sorts of innovation, but most of all - product innovations, where the possibilities to co-create value are the largest. Activation of prosumer groups will advance, of course, embracing both those sectors which operate in market conditions (competition) and in regulated or/and supported. An example of the former is ICT sector, where prosumer groups organised in networks can significantly add value to the products they use. An example of the latter area of activity might be public services, including power media supplies, medical services, public administration and public transportation. Electrical power industry, developing renewable and dispersed energy sources, applying smart power networks and measurement systems as well as active demand management, might be regarded an area piloting or initiating prosumer movement.

Among the most important present and future circumstances, influencing the achieving the objective are:

- a relatively low level of awareness and knowledge of prosumer movement;
- low level and even lack of infrastructure and technologies creating smart markets;
- growing number of constant Internet access subscribers;
- using social media for self-organization and communication among clients;
- the adopted economic, energetic and environmental policy, aimed at innovation;
- increasing interest in ICT for power efficiency and emission assessment of buildings, vehicles, lighting management, enterprise, city and region management.

- promotion of energy saving (including also smart metering) conducted by the region's power-supply enterprises;
- developing research and development competences for new technologies (smart power industry, ICR, mechatronics) at universities and research institutions;
- development of professional educational and training services, using prosumers;
- civic society activity in the scope of communicating the needs related to public services (their design, elaboration and development);
- using prosumers for designing new products and services by regional enterprises.

It should also be underlined that it is possible to create and apply the following for organization of prosumer groups: academic-research competence centres - a key link between science, business and local authorities- and functional-operative competence centres, concentrating field experts responsible for implementations, coordinating new projects, realized for smart markets development.

Among the main risk factors of achieving this objective are: non-realization of infrastructure and technology construction, vital for smart markets operation; inability to overcome mental and competence barrier for creating prosumer movement; an insignificant number of investors in the sectors which might be prosumer-based (power sector, education and training sector, public services and culture sector); weak involvement of large companies in prosumer groups creating processes; lack of acceptance for creating competence centres (academic-research as well as functional-operative); breakdown of the realization of new power policy (climate and energy package) and increased complexity of innovative processes based on prosumers as compared to closed innovative processes.

Therefore in the perspective of the Śląskie Voivodeship the key issues become: elaborating rules (standards) of creating prosumer groups linked to competence centres and clusters; the realization of project with and for prosumers (including educational and promotional projects); applying knowledge management system about smart markets development for creating prosumer groups.

Those activities should to a large extent be realized by competence centres. From their very nature, the centres are using their own resources for those activities, but they also generate knowledge base don global resources. This is especially important when it comes to applying best practices for creation of prosumer groups in the region, for there are no domestic examples in this field. What should be made use of is the fact that in the region there have arisen and are developed centres offering diversified actions for energy-saving technologies development and energy saving, e.g. laboratories and research equipment, training and advisory services, which facilitates access to knowledge and the results of the latest research in the field, but also by creating good conditions for location of businesses of advanced technologies and environment (parks, clusters). Also important is the activity of regional economic, research and social associations. Organisation of prosumers groups might be performed under competence centres' budgets, but it is also possible to co-finance them by the interested enterprises or other organisations.

2.5. Meta-measures of the Regional Innovation Strategy

the Regional Innovation Strategy will be realized via a package of meta-measures, built as a result of combining undertakings, identified while working on the strategy. This approach enables thematic and meritorious diversification of activity, which will contribute to a better coordination of processes that are taking place in the regional innovation ecosystem and allow a more effective allocation of public devoted to supporting innovation in the Śląskie Voivodeship.



The enterprises presented below allow achieving strategy objectives in a horizontal manner, which is indicated in the below chart:

		Strategic objectives achieved due to the realization of meta-measures									
		1.1.	1.2.	1.3.	1.4.	1.5.	2.1.	2.2.	2.3.	2.4.	2.5.
Meta-measure	1.	X		X	X				X		
	2.	X			X		X				
	3.		X		X		X	X	X	X	X
	4.					X					
	5.	X			X		X			X	
	6.		X		X	X		X		X	X
	7.	X		X	X	X	X		X	X	

Adopting this convention does not exclude the possibility to realize subsequent projects or bundles of projects, attributed directly to strategy objectives. Detailed stipulations in this scope will be adopted in the model of implementing Regional Innovation Strategy, the elaboration of which should be the subject or works after the strategy document is approved.

Meta-measure 1. The Śląskie Academy

The Śląskie Academy is focused on systemic support of regional research institutions and their extra-regional partners for agreeing on common long-term projects of fundamental and applied research. The creation of the Śląskie Academy is connected with the development and consequent implementation of knowledge management system within the regional innovation ecosystem. The effect of cooperation under the created platform will be new, prestigious research topics, in this entities form the Śląskie Voivodeship will achieve competence advantage in the European Research Area.

The Śląskie Academy is based on the competence of research communities of the region: individuals, research teams and academic institutions as well as on their skills regarding cooperation with key subjects in the global ambient. Therefore, for effective cooperation it will be necessary to have databases on the region's innovative communities' competences and databases on the state of research in the region, in integrated knowledge areas. Moreover, an important issue will be the co-usage of the existing research infrastructure and for selected areas also important will be the creation of key regional academic research infrastructure - flag investment projects.

The creation of the Silesia Academy will be possible thanks to a system of field technological observatories, operating in the region, and the creation of regional centre for research and studies on smart markets' and technology markets' business models. That initiative should be co-created by universities and research institutes of the region and implementation partners. It is also necessary to continue the works connected with developing technological observatories and creating new observatories. Naturally those observatories should continue the implementation of hitherto initiated foresights realized in the region. Their experiences will be used in the works of the Regional Territorial Observatory conducted by Marshall's Office of the Śląskie Voivodeship. The objective behind creating a regional research centre will be to gather best practices within business models applied on technology markets and smart markets, dissemination of patterns and solutions and finally elaborating business models for regional innovative initiatives.

The achievement of the above described assumptions will allow us to strengthen the regional innovation ecosystem by achieving readiness in the region for the operation of an interdisciplinary centre (interdisciplinary centres) of research application. This centre (these centres) will be entities following market trends and technological interests of businesses operating on a global scale and recognizing possibilities to co-finance the selected research and implementation topics in public and private dimensions. Gaining the ability to quickly create implementation teams and conglomerates in the identified areas and to support them in making contacts, preparing projects and creating conduct frameworks for managing such projects, will become a factor propelling the expansion of the region's technological offer.

Meta-measure is of horizontal nature, combining the realization of goals.

- 1.1. Supporting changes in innovative communities, strongly cooperating with knowledge and information creation centres on the global scale.
- 1.3. Network co-creation and co-usage of research infrastructure by academic entities, universities, businesses and public utility institutions
- 1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services
- 2.3. Construction of a new infrastructure of smart growth, based of low-emission technologies and energy efficiency

Meta-measure 2. Cooperation of cluster initiatives and innovative communities

The core of meta-measure is the continuation of activities conducted in the region for the development of technological clusters created around key technological areas specified in Technology Development Program. These activities facilitate further activation of actors of innovation ecosystem such as: local authorities, business environment institutions or social circles.

Strengthening innovative communities of the region is based on the experiences of the existing clusters and cluster organisations in the world and in the region as well as on the participants' know-how. In the regional dimension, an important issue is to further develop opportunities for experience exchange and for building links among the cluster initiatives active in the region. Also vital is to ensure support in cluster management processes, activation of their participants, building strategic development assumptions and acquiring financing sources. Training and counselling for cluster animators (managers) should be diversified and at the same time the coordination both in the regional scale and with national and European programs realized. This effect might be achieved by creating a regional cluster initiatives cooperation centre, which would thrive on the attainments of hitherto forms of inter-cluster cooperation in the Śląskie Voivodeship.

One of the propelling forces of further business and R&D activities in the region will be the functioning of networks of counsellors for innovation management and networks of region's technological "ambassadors". The essence of the former form is tightening the cooperation among persons and entities operating in the area of counselling services for companies, strengthening their professional competence as counsellors for innovation management, organizing thematic seminars for counsellors and complementing their detailed knowledge as a result of cooperation with field experts. The activity of the network of region's technological representatives ("ambassadors") in countries and regions with considerable innovative dynamics is related to the use of existing institutional contacts of regional entities and with establishing own offices for constant presence of the region representatives and current promotion in personal contacts, in countries and regions important for markets with

considerable innovative dynamics (Silicon Valley, Chinese and Indian industrial regions, Cambridge, Sophia Antipolis etc.). This network will ensure attaining feedback and enabling the "first contact" for entities from the region.

As a result of actions undertaken in the area of technology transfer and animation of economic cooperation. Mutual information exchange, dissemination of basic data about the technological portfolios owned and organization of thematic seminars will contribute to constant strengthening of their competence, including the international ones, oriented on creating internationalization strategies and ensuring counselling on international operation. A step-by step increase of trust within cluster initiatives and innovative communities, as well as ever higher awareness of mutual expectations will also contribute to a higher amount of agreements related to the participation of young academic workers in task teams within companies, and the participation of young workers of companies in the works of research teams.

Meta-measure is of horizontal nature, combining the realization of goals.

- 1.1. Supporting changes in innovative communities, strongly cooperating with knowledge and information creation centres on the global scale.
- 1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services
- 2.1. Co-creation of competence centre network for the development of smart markets

Meta-measure 3. Realization of pilot actions under regional specializations

The Śląskie Voivodeship consequently focuses on selected fields of technological specializations. Activities in those fields are enforced by means of foresight studies and by Technology Development Program. A realization of a meta-measure determines a further supporting the regional specializations. Bearing this in mind, realization of activities realizing new processes and services is assumed within selected technological areas, in particular aiming at creating smart markets of those products and strengthening the broadly understood creative industries in the region. Those processes are based on identifying key areas of smart markets and key actors of those markets on the demand and the supply part as well as general partners. This requires not as much activity on commercial markets as also expansive activities in public services sector (e.g. pilot initiatives in medicine). An important element of this meta-measure becomes the conversion of post-industrial places and economically deteriorating places into areas of creativity, science and culture. This sort of activities conducted in the form of pilot projects enable to specify the scope of functioning of competence centres in the region, activate a network of *living labs* and demonstration centres connected with technological parks and similar institutions, and in consequence encourage main stakeholders to actively join in the processes realized in the regional innovation ecosystem.

Pilot activities are based on the existing potentials of subjects involved in developing regional specializations and their openness for global processes. Key institutions include entities from the medical and power industry, particularly well-developed in the region and highly predisposed towards participation in smart markets. Also entities operating in IT and materials engineering industries, providing technological background of horizontal nature. Simultaneously, on post-industrial premises and in objects that are deteriorating from the economical point of view a transformation is taking place towards creating technological, industrial background and information-training infrastructure of creative business - places which attract foreign investors and are the region's show-piece.

Realizing pilot actions is possible also thanks to the activity of entities operating in various phases of value chains, the cooperation among which is enforced by professional animators. In life science sector this pertains also to the academic sphere in the field of medical engineering and biotechnology as well as health care facilities, technological companies, patients and insurance companies. In power industry pilot actions may embrace full range of activity - beginning from innovative solutions through to conventional power industry and prosumer activity on energy market.

Those activities will ensure the realization of horizontal undertakings' package and as a consequence - crating the region's image on a global scale. This image will be based on high-quality public services in the strongly metropolising Śląskie Voivodeship, an on the operation of demonstrative centres and networks, based on direct experiments and virtual presentation of processes. Distinguishing places of highest concentration of key actors will become a basis for creating competence centres, which in a long-term perspective will allow for elaborating methods and systems promoting prosumer activity. Locating the activity of businesses and communities in places that facilitate high level of creativity and absorption of new technologies will enable to transfer their activity into global markets.

Meta-measure is of horizontal nature, combining the realization of goals.

- 1.2. Reaching perfection in the field of medical services, realized in a partnership of clinical centres, high-technology, research and innovation units of businesses, including medical and biotechnological engineering
- 1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services
- 2.1. Co-creation of competence centre network for the development of smart markets
- 2.2. Significant advancement of digitalization in public services networks, in particular in the medical, public administration and education sector
- 2.3. Construction of a new infrastructure of smart growth, based of low-emission technologies and energy efficiency
- 2.4. High level of participation of SME sector businesses in regional and meta-regional cooperation networks, increasing its participation in smart markets
- 2.5. Strengthening the activity of prosumer groups

Meta-measure 4. Labour market foresight

The essence of the undertaking is the realization of actions aimed at extending the existing observatories of labour market to the strengthened component of forecasting and creating future on labour market. In consideration of the above mentioned, cooperation is intensifies between employment offices and communities representing entrepreneurs as well as with technological observatories. This increases the effectiveness of formulating recommendations for education system in the scope of building competence facilitating the future professional adaptation.

The meta-measure is being realized in connection with restructuring professional, practical and post-elementary education. It is expected that communities of small and medium entrepreneurs will get involved in the realization of educational programmes. Coherence of conduct is strengthened by the realization of pilot projects related to program frameworks, internship frameworks and education infrastructure. What is becoming increasingly important is the application of local communities' creativity, a sort of endowing local and sub-regional initiatives, promoting entrepreneurship, innovation and creativity, with a "second speed". This is related to: creating new initiatives in this regards, creating thematic groups and task teams, organizing trainings and coaching, activating young people and

promoting local economy. Integration of personal development aspects become a key issue, which is also related to the creation of new ways of solving social problems. In the scope of fitting competences and skills of workers and future employees to the changing economy of the Śląskie Voivodeship, a complementary task is to apply technological observatories that are developing in the region.

The meta-measure implementation mechanism concentrates on creating local and sub-regional partnerships aimed at validating the existing post-elementary education with a profile preparing for technical specialization or profession, and also on shaping the overall education system structure - including life-long learning. Complementary used in this scope are the results of technological foresights and other works conducted by observatories, operating in the regional innovation ecosystem.

Those activities will enable to build competitive advantage of companies from the region on a global scale, thus allowing addressing the risk that results from the appearing trends in world and regional economy, applying the present high quality of human and social capital.

The meta-measure is realizing strategic objective 1.5. Multiplication of knowledge, skills and competence of entities creating the innovation ecosystem.

Meta-measure 5. Regional pro-innovative fund

Access to capital enabling minimization of risk related to conducting innovative activity or catalysing it appears to be one of key factors influencing innovation development. A process created in the region due to the realization of meta-measure is the complementing of innovation financing offer by a stable regional instrument. The regional pro-innovative is, in an independent manner and maintaining the willingness to finance risky projects, supporting activities related to, among other things: intellectual property securing strategies, securing intellectual ownership, realization of small grants for research and pilot expert reports, ordering research works or research and implementation cooperation of science and business or cluster cooperation.

Creating the fund, region uses the potential of local government and other partners including, as possible, also those from the private sector. Launching the fund might be supported by special funds or national or European programmes addressing the incubation of revolving funds. From ideological perspective the fund's organization consists in supporting financial mediators, who would organize private capital combining it with public capital and effectively manage it, searching for and investing in innovative enterprises. An important issue for the realization of fund concept becomes the experience of business-environment institutions in the scope of loan funds, seed funds etc.

Potential beneficiaries of the fund include actors of regional innovation ecosystem, in particular companies operating in technological parks, clusters, strongly involved in research and development works conducted together with universities and research institutions. Financing available from the funds' means can support the development of networks of *living labs* and competence centres and constitute an important complements of actions related to animating cooperation and performing broker activities.

The application of pro-innovative fund will allow intensifying technology transfer and research commercialization processes and most of all to implement the ready solutions, thus limiting the risk in financing enterprises by entities introducing new products and services in the global market.

The meta-measure is oriented at holistically supporting the dynamics of regional innovation ecosystem, but in particular it combines the realization of the following objectives in a horizontal manner:

- 1.1. Supporting changes in innovative communities, strongly cooperating with knowledge and information creation centres on the global scale.
- 1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services
- 2.1. Co-creation of competence centre network for the development of smart markets
- 2.4. High level of participation of SME sector businesses in regional and meta-regional cooperation networks, increasing its participation in smart markets

Meta-measure 6. Design for innovation

The essence of the enterprise is the horizontal support for innovative activities in the region through equipping private and public sector entities in competences related to planning (broadly understood design), which is to increase the quality of public and private services as well to introduce better and more innovative products.

Design is particularly important in the process of introducing ideas to the market and transforming them into products or services meeting the customers' needs. The Śląskie Voivodeship still has a low level of infrastructure and skills in the scope of design both in higher education and in businesses or public institutions.

The relation between innovation and design which is one of user-focused innovation implementation instruments, is a topic commonly known in the world. Nevertheless, interaction among those fields was to date often restricted due to relatively narrow understanding of design in the categories of pure 'design art' or superficial stylisation of products. Thus, design is a field which is still gaining on importance and application.

Design that serves the development of innovation entails orienting ones actions at the user. In practice this means the introduction of an idea and elaboration of a plan for a new or significantly enhanced product, service or system which will ensure best possible consonance with the needs, aspirations and skills of the user and will allow taking into account sustainable economic, social and environmental development.

Here it is worth noting various types of innovation, including innovation of meaning, described by Roberto Verganti (R. Verganti, *Design Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean*, Harvard Business School Press, 2009). While part of innovative activities is based in the analysis of clients' and consumers' needs, innovation of meaning assumes that it is the businesses, the entrepreneurs or designers who can become the source of innovation. They have the possibility to create products and services, the users of which are not able to denote at the present moment and which might become the technologies of tomorrow. Innovation in this field is design driven. Radical change requires creative thinking and courageous actions instead of repeating clichés or constantly asking customers what they want.

Meta-measure accounts for further activation of the private and public sector for strengthening market potential of products and services through encouraging and supporting the implementation of innovation through design. In this aspect design-awareness actions are necessary, such as thematic workshops and training, creating opportunities for making contacts with field experts, but also

awareness events creating the region's image. Those include, among others: exhibitions and activities promoting design, tools and methods of the so-called design thinking, competitions, and meetings with design field experts. A much more important activity is, nevertheless, initiation actual project undertakings related to implementation of innovative services and products, on which the efforts of various entities will be concentrated within this meta-measure in the years 2013-2020. Additionally, what is more important is engaging designers in the process of shaping public utility places (public space design, communication systems design etc.).

The mechanism of meta-measure implementation is developed by settling the initiatives that already exist in the Śląskie Voivodeship, extending the scope and scale of their realization and also encouraging new entities to undertake actions related to design. It becomes a natural approach to further apply the avalanche effect, released by several regional, municipal and business initiatives and using the scale of phenomena for increasing the use of design in the process of shaping products and services, realized both by the private and the public sector.

So understood activities will allow companies to attain new possibilities for market development - both in the scope of offering modernized and new products on the existing markets and in the scope of gaining new markets, while allowing public sector institutions to increase the quality and availability of public services in the Śląskie Voivodeship.

Meta-measure is of horizontal nature, combining the realization of goals.

- 1.2. Reaching perfection in the field of medical services, realized in a partnership of clinical centres, high-technology, research and innovation units of businesses, including medical and biotechnological engineering
- 1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services
- 1.5. Multiplication of knowledge, skills and competence of entities creating the innovation ecosystem
- 2.2. Significant advancement of digitalization in public services networks, in particular in the medical, public administration and education sector
- 2.4. High level of participation of SME sector businesses in regional and meta-regional cooperation networks, increasing its participation in smart markets
- 2.5. Strengthening the activity of prosumer groups

Meta-measure 7. Cooperation with neighbouring regions for innovation

The essence of the enterprise is applying the potential of cooperation with neighbouring regions for generating returns to scale and facilitation the propagation of selected technological solutions on a larger, highly or relatively highly urbanized and densely populated territory. The following voivodeships are our key partners in this process: the Małopolskie Voivodeship and the Opolskie Voivodeship as well as the Moravian-Sląskie Region in the Czech Republic and the Žilina Region in Slovakia.

The meta-measure covers commercial, scientific and research-implementation cooperation in the territory of the tripoint of the Czech Republic, Poland and Slovakia as well as in southern Poland. In the business scope it pertains to: cooperation of entrepreneurs' organisations and clusters, common initiatives for increasing the intensity of trade exchange and cooperation, in the case of cross-border activities informing about relevant legal and administrative regulations for conducting commercial

activities abroad, organisation of common economic forums and other *b2b*-type activities. In academic and research-implementation relations the focus is on increasing the amount of common, large, strategic projects in the European perspective in the area of fundamental and applied research - realized mostly by universities, research and technological parks as well as businesses or economic local governments who represent them. This cooperation gains special importance in such fields as: materials technologies, conventional renewable power industry and IT. Also important are activities that increase the innovative potential of SME. Activities in the scope described above are supported by student, teaching assistant and staff mobility programmes.

The mechanism of implementing the meta-measure is based on two institutional pillars, created in cooperation with the Śląskie Voivodeship, i.e. on the European Grouping of Territorial Cooperation TRITIA and on cooperation strategy implementation system of the Śląskie and Małopolskie Voivodeships. Also, the agreement of 11 universities from the Polish-Czech-Slovakian borderland for innovative activities PROGRES3 and the cooperation between Polish and Czech universities within the Śląskie Universities Rectors Conference. Business environment institutions and business and business-scientific cooperation network created around them are using and continuing the attainment of CERADA – *Central European Research and Development Area*. The region's aspiration is placing the described activities in the perspective of implementing the European "Horizon 2020" initiative.

Cooperation with neighbouring regions will open new possibilities of creating business activities for companies from the Śląskie Voivodeship. It will enable to better position universities and their research-implementation offers in the European perspective. In a broader dimension this will contribute to the creation of the cross-border region's innovative image on the world scale, with individual benefits this evokes for entities located in the region as well as for the Śląskie Voivodeship itself.

Meta-measure is of horizontal nature, combining the realization of goals.

- 1.1. Supporting changes in innovative communities, strongly cooperating with knowledge and information creation centres on the global scale.



- 1.3. Network coo-creation and co-usage of research infrastructure by academic entities, universities, businesses and public utility institutions
- 1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services
- 1.5. Multiplication of knowledge, skills and competence of entities creating the innovation ecosystem
- 2.1. Co-creation of competence centre network for the development of smart markets
- 2.3. Construction of a new infrastructure of smart growth, based of low-emission technologies and energy efficiency
- 2.4. High level of participation of SME sector businesses in regional and meta-regional cooperation networks, increasing its participation in smart markets





3. Implementation provisions

3. Implementation provisions

3.1. Monitoring and evaluation system

Realization of tasks in the area of management and monitoring of the Regional Innovation Strategy of the Śląskie Voivodeship for the years 2014-2020 will be based on the hitherto structures:

- Regional Innovation System Managing Unit (JZ RSI),
- Regional Innovation Strategy Implementation Coordination Unit (JKW RIS).

The task of RSI Managing Unit is, among other things, building and developing Regional Innovation Ecosystem in the Śląskie Voivodeship and also animating and supporting the emerging networks and consortia of innovative communities.

RIS Implementation Coordination Unit, appointed on behalf of the Marshal's Office of the Śląskie Voivodeship, functioning in cooperation with European Social Fund Department, monitors the realization of tasks and oversees accuracy of their realization. Each year, based on yearly reports from the realization and on monitoring indicators, the RIS Implementation Coordination Unit presents the Voivodeship Government and the voivodeship local government assembly about the level of tasks realized.

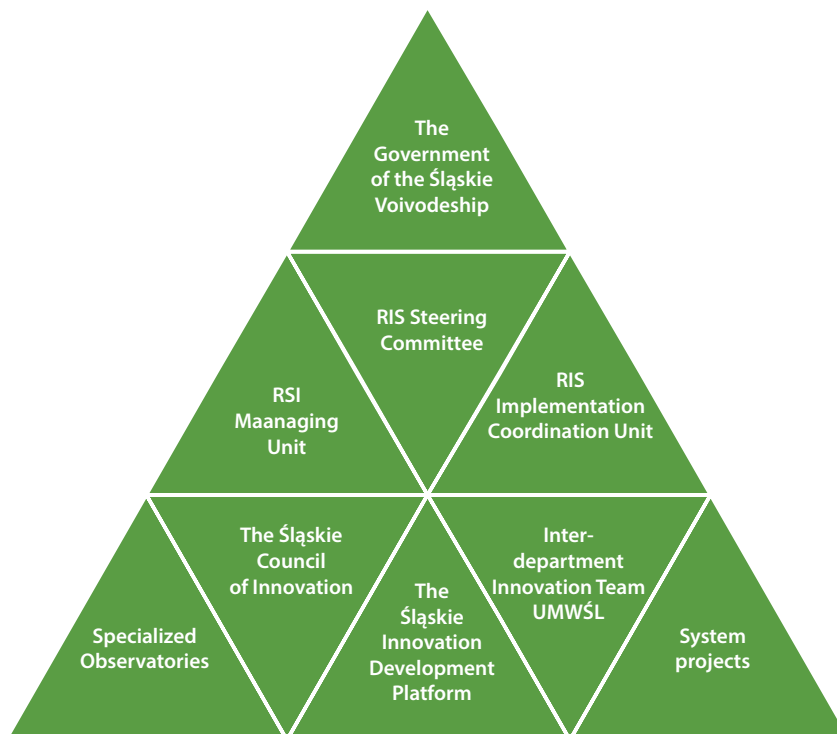
Moreover, in meritorious arrangement the control over realization of the strategy is held by the Regional Innovation Strategy Steering Committee, the role of which is that of an opinion-giving and advisory body for the Voivodeship Government regarding matters related to implementation or the Regional Innovation Strategy as well as with programming, coordination, realization, monitoring and assessment of the



policy in the scope of voivodeship innovative development. The activities of the Steering Committee are supported by the Śląskie Council of Innovation (ŚRI), the aim of which is to undertake meritorious works on the main tasks that result from the current needs of the region in the area of innovative development. The effect of ŚRI works is the submission of expert opinions and reports on the meetings of Regional Innovation Strategy Steering Committee (KS RIS).

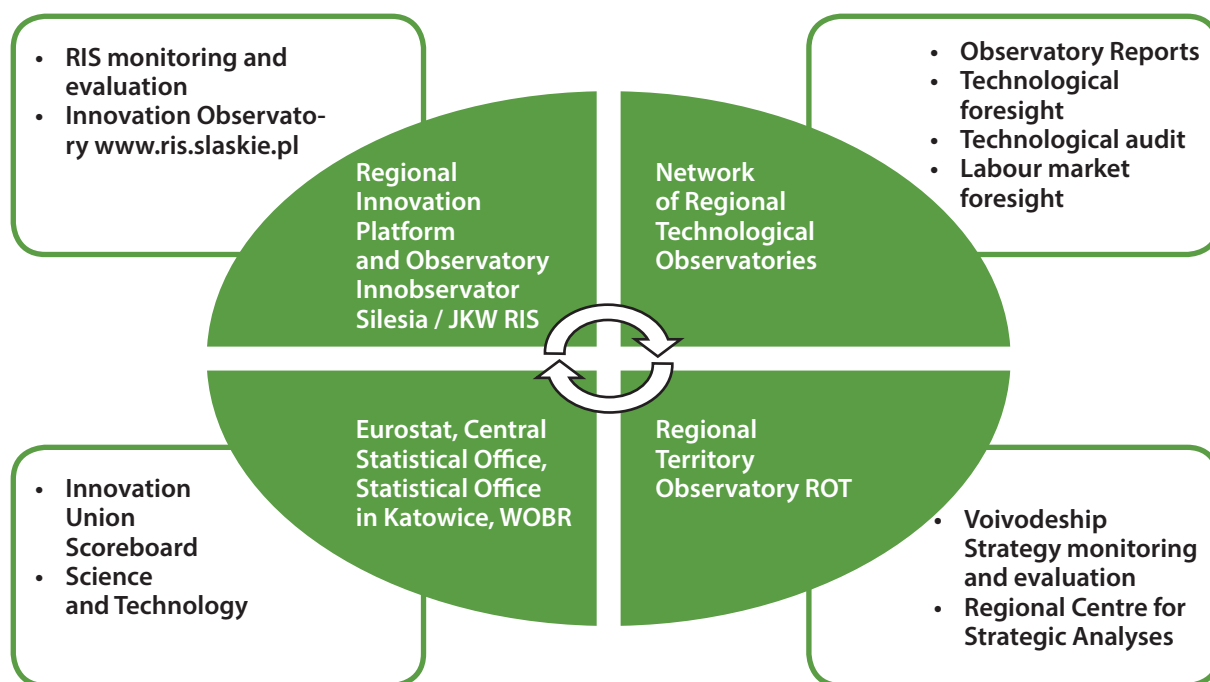
The structure of RIS management and implementation system is presented on the illustration below.

Fig.1 RIS management and implementation system structure



The development of Regional Innovation Strategy implementation system according to the adopted vision of creating Śląskie Voivodeship innovation ecosystem, together with detail actions, will be included in the Regional Innovation Strategy implementation model. Under this model the institutional and functional structure of RIS monitoring is depicted in the picture below.

Fig. 2. Institutional and functional framework of RSI monitoring



The objective of monitoring and evaluation is to gather, report and interpret data describing the region's progress and evolution as well as the effects of public intervention (a project, programme or strategy). In this scope monitoring is focused mainly on the level of result and progress, and evaluation is mainly interested in influencing, in particular medium- and long-term. Most importance from the perspective of realizing strategy will be attributed to impact indicators, reflecting the realization of the vision and determining the effects of the undertaken actions in the region, also after the period of strategy implementation, and result indicators reflecting the realization of priorities. Product indicators will be specified at the project level ingrained in particular enterprises.

Assuming that the subject of evaluation is the vision realized, the formulated priorities, strategic objectives and meta-measure and projects, a proposition of making the scope of the attained effects arranged in a more cascade-like manner and more detailed. The monitoring structure is presented at the fig. 3

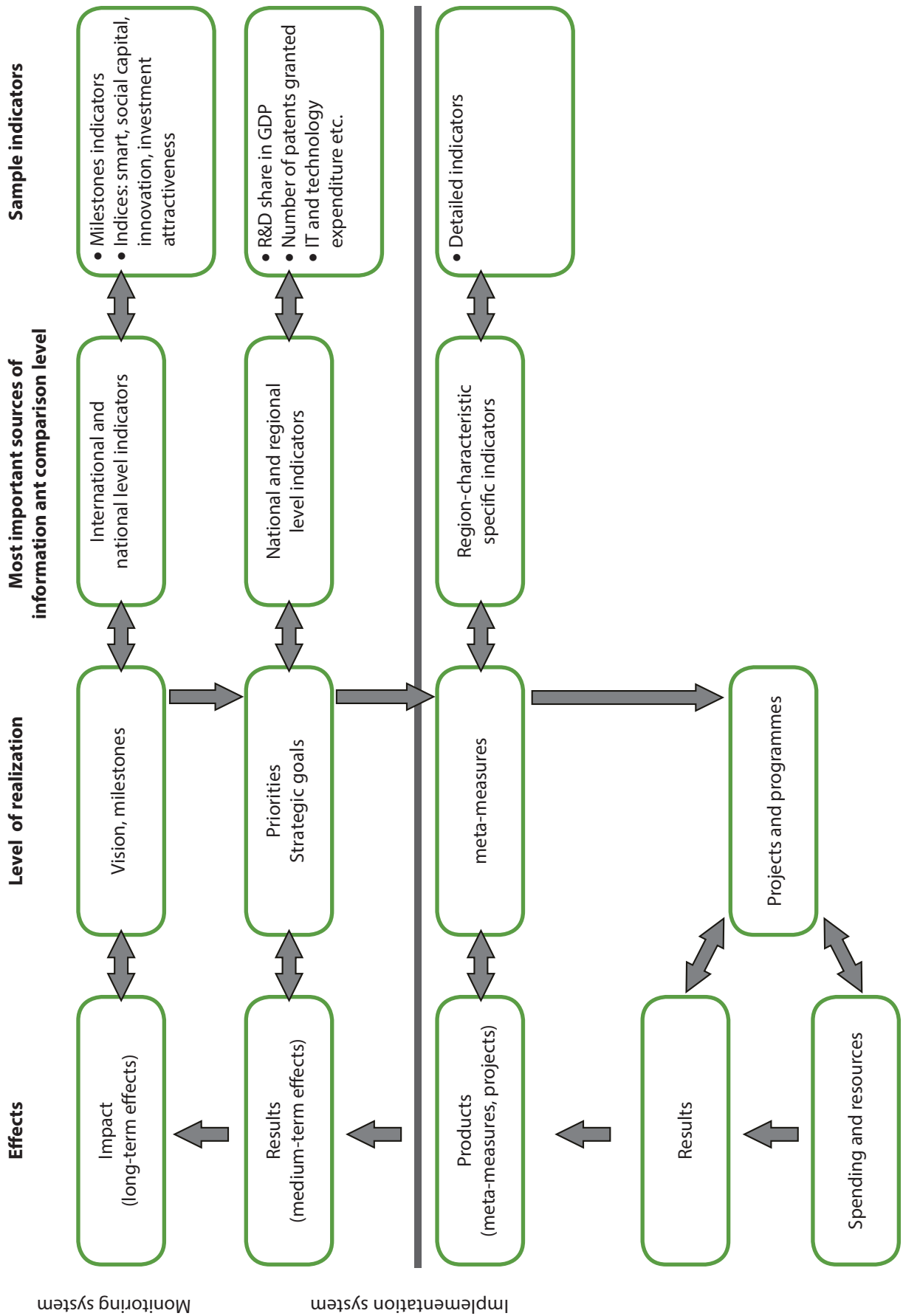
The objective of monitoring system is to examine qualitative and quantitative progress related to the realization of Regional Innovation Strategy. The **key assumptions** of the monitoring systems include:

1. Elaborating impact indicators related to the realization of visions (i.e. the milestones and indices) and result indicators at priorities level. Impact indicators include: milestones, determining the realization of a vision - innovation ecosystem, complemented by horizontal indicators - smart indices, knowledge capital, social capital, innovation and investment attractiveness indices. Result indices described at priorities level qualitatively determine key indicators that create the basis for realizing the Regional Innovation Strategy objectives. Product indicators will be reflected in particular projects, which are simultaneously a part on meta-measures.
2. Strategy realization monitoring system is based in determining element of monitoring indicator description, i.e.
 - indicator features - they describe its fundamental parameters which should be examined and assessed,

- influence of public intervention at the regional level - it points to the meaning of public intervention for the realization of the indicator,
- Data availability - it describes whether an indicator is examined and if generally available sources of information exist, or whether own measurement system needs to be elaborated that is key for strategy realization, complementing regional information system with this indicator,
- data sources - determination of a direct source from which data and/or sources can be obtained that describe the indicator at national, European or world level,
- basic value, exit value - basic value specifies the state of all indicators in one time interval, i.e. at the end of the year 2013; exit value renders the current value according to latest data,
- change dynamics/expected indicator level - specifies the dynamics of the indicator development - position or numeric value
- measurement method - designates the pointing to a proposition for indicator measurement using specified methods.



Fig. 3 RIS monitoring structure



1. For formulating indicators of RIS realization such indicators were taken into consideration as would enable to achieve social, economic and environmental cohesion:
 - social cohesion regarding relation to employment, education and also human and social capital development
 - economic cohesion, the main axis of which are the relations for effects, transformation and spending assessment
 - environmental cohesion regarding the development of a sustainable and safe region.
2. Elaborating measurements for indicators (regardless of whether this pertains to qualitative or quantitative indicators) is based on the assumption that an indicator of a model-position state is determined. Observation and analysis of indicators' dynamics will enable the assessment of progress (or the lack of it) or a threat to the realization of a specific priority or goal. Trends, developed on this basis might be applied for updating RIS. The identified threats, on their part, will constitute a basis for undertaking relevant actions, e.g. intensifying the used support instruments or application of new ones.
3. Spatial comparisons of indicators enable the assessment of state and position of a given indicator in relation to the best results (such as are deemed model results), *benchmarks*) which combined with dynamic analysis renders a broader spectrum for the assessment of the region's position.
4. Measurements (measures) adopted in the monitoring systems are subject to tests for: relevance, concentration, actual intent (authenticity) and sustainability. Testing will ensure comparability and meritorious accuracy of objectives measurements. Unfortunately, some of the indicators' values might be shifted in time, which depends on reports presented by European institutions.
5. While determining monitoring indicators of the Strategy reference to indicators formulated in key documents was adopted: Europe 2020, Long-Term National Development Strategy, Innovative and Effective Economy Strategy, Human Capital Development Strategy, Social Capital Development Strategy, Energetic and Environmental Safety, Development Strategy of the Śląskie Voivodeship "Śląskie 2020", Technology Development Programme of the Śląskie Voivodeship for the years 2010-2020.

Within the prepared model of RIS implementation, dependent on the adopted new financial limits, projects will be determined for the realization of meta-measures, for which a detailed assessment system will be specified.

An important role in the process of monitoring the Strategy will be played by regional observatories like: Innobservator Silesia and specialized observatories developed in the region.

Result indicators monitoring will be performed in a yearly cycle, impact indicators will undergo assessment based on 6 evaluations:

- ex ante – 2013,
- during 2018 - milestones and indices indicators
- ex post – 2021 – all indicators
- 3 thematic evaluations - social capital index and smart index and one additional, stemming from current needs.

I. VISION MONITORING								
Milestones realization indicators								
indicator (of impact)	indicator features	influence of public intervention at the regional level	data availability	sources of data	measurement moment	base value exit value	indicator changes dynamics	method of measurement
Regional system of information on innovative activity of the region	Indicator of construction of a regional knowledge node/community	high	requires separate evaluation	Innobservator Silesia, evaluation research	2018 2021	0	1	direct research
Number of world class clusters	<ul style="list-style-type: none"> - Boundary conditions - Cluster actors and participants - Organisation of the cluster - Indicator of SME share in global economy chains. - Identification of regional key clusters, simultaneously determining their smart specializations 	high	requires separate evaluation and introduction to regional information system	Innobservator Silesia, evaluation research	2018 2021	0	growth, target 2	direct research
Number of objects in shared research and development infrastructure in the region	Indicator of key research infrastructure in the region	high	requires separate evaluation and introduction to regional information system	Innobservator Silesia, evaluation research	2018 2021	0	growth, target 4	direct research

Number of key competence centres in priority areas of Technology Development Programme of the Śląskie Voivodeship for the years 2010-2020	Number of competence centres (end of the year value)	high		requires separate evaluation and introduction to regional information system	Innobservator Silesia, evaluation research	2018 2021	no data available	growth, target value 8	direct research
Number of living-labs related to smart markets	Creating smart markets	high		requires separate evaluation and introduction to regional information system	Innobservator Silesia, evaluation research	2018 2021	0	growth, target value 16	direct research
Number of projects financed by EU framework programmes, the leaders of which are entities from the region	Indicator of participation in global networks.	high		requires separate evaluation and introduction to regional information system	Innobservator Silesia, evaluation research	2018 2021	no data available	growth, target 32 (cumulated value 2014-20)	direct research
Number of academic-research consortia for projects realization	Construction of technological perfection poles and knowledge generating centres	high		requires separate evaluation and introduction to regional information system	Innobservator Silesia, evaluation research	2018 2021	no data available	growth, target 64 (cumulated value 2014-20)	direct research
Number of persons employed in innovative businesses	Human resources for innovation	low		available	GUS	2018 2021	no data available	growth, target 128 thousand people	indicator counted according to the methods of Central Statistical Office

Number of businesses introducing product and service innovations in % of total SME number	The indicator embraces spending on research and development works (R&D) related to elaborating new and significantly improved products (product innovations) and processes (process innovations), performed by own development or one purchased from other entities.	low	available	Central Statistical Office Local Data Bank	2018 2021	20.32	growth, target value 25.6% (256 in 1000)	indicator counted according to the methods of Central Statistical Office
Value of innovative actions support	The funding of innovative actions	large	requires separate evaluation and introduction to regional information system	Innobserverator Silesia, evaluation research	2018 2021	no data available	growth, target value at the level of min. 512 million	analysis of data from primary and secondary sources
Number of region's inhabitants included in creativity and innovation actions	Development indicator of innovative culture in the region	large	requires separate evaluation and introduction to regional information system	Innobserverator Silesia, evaluation research	2018 2021	no data available	growth, target value 1024 thousand	quantitative research on selected samples

Horizontal indicators of vision monitoring						
smart index for smart specializations	<ul style="list-style-type: none"> - Share in the income of smart specializations - Employment in the organisations of smart specializations - Number of students and researchers in the group of smart specializations - Number of clusters in smart specializations - Number of enterprises and projects in smart specializations - Value of projects and enterprises in smart specializations 	high after indicating smart specializations	requires separate evaluation and introduction to regional information system	region-created custom indicator, thematic observatories	2018 2021	no data available
					growth	<ul style="list-style-type: none"> thematic evaluation quantitative research on selected samples direct research benchmarking indicator analyses (e.g. radar diagrams)

Knowledge Index - KI	<p>KI is based on three indicators</p> <ul style="list-style-type: none"> - Education and human resources: level of literacy among adults, share of people receiving secondary education as compared to total population in the age relevant for secondary schools, share of persons receiving higher education s compared to total population in the age relevant for higher education. - Innovation System: R&D sector researchers, patent applications approves, number of academic essays in academic and technical journals per million of citizens; - Information technologies: telephones per 1.000 people, computers persons 1.000 people, Internet users per 10.000 people. 	low	requires separate evaluation and introduction to regional information system	region-created own indicator	2018 2021	no data available at the regional level for the country 7.20 Education - 7.76 Innovation - 7.16 ICT - 6.70	at the regional level dynamics - growth - to the value of 8.29 (half way to the ranking's leader - Sweden)	benchmarking on the basis of the international and national KI indicator
social trust index, including in particular trust level	<ul style="list-style-type: none"> - Trust in cooperation networks (clusters, academic-research, academic-business consortia etc.) - Trust for public services 	high	requires separate evaluation and introduction to regional information system	region-created own indicator	2018 2021	no data available at the regional level	growth	thematic evaluation benchmarking on the basis of the international and national KI indicator <i>European Social Survey.</i>

innovativeness index	Position of the voivodeship among regions with highest innovativeness levels	low	indicator available measured on the regions level	Regional Innovation Scoreboard	according to the work cycle of the European Commission	4th position in the year 2009	growth - target in the top three	on the basis of Regional Innovation Scoreboard
investment attractiveness index	Position of the voivodeship in the context of investment attractiveness	low	indicator available measured on the regions level	Investment Attractiveness of the Region (The Market Economy Research Institute (IBnGR))	yearly	1st position in the year 2010	maintaining the position	Investment Attractiveness of the Region

II. PRIORITY MONITORING

Priority 1.

Increasing and internal integration of the region's innovative potential

indicator	indicator features	influence of public intervention at the regional level	data availability	data sources	measurement moment	base value present value	indicator changes dynamics	method of measurement
Share of public expenditure on R&D in GDP (GOVERD+HERD)	Indicator counted according to the methodology of the Central Statistical Office taking into account spending financed by the National Science Centre (NCN), the National Centre for Research and Development (NCBIR) Ministry of Science and Higher Education (MNISW), EU	low	indicator available measured on the regions level	The Central Statistical Office - Science and Technology in Poland	yearly	no data available	growth	indicator counted according to the methods of Central Statistical Office

Share of public expenditure on R&D in GDP (BERD/PKB)	Indicator counted according to the methods of Central Statistical Office	low	indicator available measured on the regions level	The Central Statistical Office - Science and Technology in Poland	yearly	no data available	Growth with higher dynamics that with public sources	indicator counted according to the methods of Central Statistical Office
Number of patents granted to entities from the Śląskie Voivodeship	Indicator counted according to the methods of Central Statistical Office	low	indicator available measured on the regions level	The Central Statistical Office - Science and Technology in Poland	yearly	233 (2009) 2 position in Poland	Increased number of patents at least maintaining the position	indicator counted according to the methods of Central Statistical Office
Industrial businesses which were cooperating in the scope of innovative activity within cluster initiative, in % of total businesses	The Central Statistical Office / innovative activity of businesses	high	indicator available measured on the regions level	The Central Statistical Office / innovative activity of businesses	yearly	0.9 (2008-2010) – 4th position	growth - position in the top three	indicator counted according to the methods of Central Statistical Office
Businesses from services sector, which were cooperating in the scope of innovative activity within cluster initiative, in % of total businesses	Central Statistical Office / Innovative activity of businesses	high	indicator available measured on the regions level	The Central Statistical Office / innovative activity of businesses	yearly	0.4 (2008-2010) – 7th position	growth - position in the top three	indicator counted according to the methods of Central Statistical Office

Priority 2.
Creating smart markets for future technology

indicator	indicator features	influence of public intervention at the regional level	data availability	data sources	measurement moment	base value present value	indicator changes dynamics	method of measurement
Spending on information technology as % of GDP	IT spending (computer hardware, software) and telecommunication technologies (teleinformation networks, telephone technology, radio, television or signalling equipment) in percentage of region GDP	low	no data available	Eurostat/ EITO	yearly	no data available	growth	secondary data analysis
Share of export of high-technology products in the production sold of the Śląskie Voivodeship	Share of high-technology and medium-high-technology products on the basis of OECD list according to the Standard International Trade Classification (SITC, Rev. 4); list approved by Eurostat in April 2009 - in products sold in the industry	low	available	Central Statistical Office/ Nauka i Technika	yearly	20.6 (2009) 1st position	maintaining the 1st position	indicator counted according to the methods of Central Statistical Office
Influx of foreign direct investment (BIZ) in million EUR	Yearly influx of BIZ in the region expressed in million Euro	average	available	National Bank of Poland	yearly	no data available	growth	indicator counted according to the methods of National Bank of Poland

Definitions of terms used in monitoring

Regional system of information about innovative actions of the region - open information system about innovative activities taking place in the region (Innobservator Silesia). Indicator of construction of a regional knowledge node/community serves for monitoring the construction of regional network system of knowledge flow and concentration.

Key cluster - a cluster in accordance with the specialization specified in region's strategic documents (Development Strategy of the Śląskie Voivodeship, Technology Development Programme or Regional Innovation Strategy), reflecting the assumptions of 'smart' and meeting regional or central distinguishing criteria¹ which, apart from specializations, can be: indicator of involved entities, number of externally financed projects realized indicator.

World Class Cluster – according to the White Paper, World Class Clusters² is a “power cluster” rooted in an “area cluster”. There are fifteen criteria for cluster assessment from the perspective of compliance with WCC assumptions, collected into three main criteria groups:

- criteria related to framework conditions –availability of science and education (education, research, innovation)
- criteria related to cluster actors - factors determining the ability of cluster participants to maintain a high competitive position via innovation
- criteria related to the organisation and management of the cluster - factors determining the quality of professional cluster management, application of modern management methods and instruments.

Shared R&D infrastructure objects in the region - indicator of the number of this sort of objects covers shared investments and shared management of material infrastructure for conducting fundamental research by at least two public institutions or under public partnership.

Technological observatory - a continuous project conducted by business-environment institution or an independent business, consisting in monitoring the development of a technological area specified in documents and forecasting its future development.

Competence centre - an organisational unit or a network of units (universities, research units etc.) made up of researchers, analysts, field experts who, by becoming a key link between science, business and local authorities, will be responsible for initiating and realization of innovative projects with high competitive potential and providing knowledge in these processes. In this document scientific-research competence centres (NBCK) and functional-operative competence centres (FOCK) were distinguished. Competence centres should be in accordance with technological areas specified in the “Technology Development Programme of the Śląskie Voivodeship for the years 2010-2020”: “medical and health care technologies; power industry and mining technologies; environmental protection technologies; information and communications technologies; materials production and processing; transportation and transport infrastructure; machine, automotive, aircraft and mining industries; nanotechnologies and nanomaterials.”

¹ Up to date no Poland-wide criteria for key clusters were specified. Poland-wide recommendations in this scope adopt as their basis mainly qualitative criteria such as: critical mass, development potential, partnership and synergies, coordinator's potential (see: Kierunki i założenia polityki klastrowej w Polsce do 2020 roku. Rekomendacje Grupy roboczej ds. polityki klastrowej (projekt, wersja I), red. M. Dzierżanowskiego, PARP Warszawa 2012, http://www.pi.gov.pl/PARPFiles/file/klastry/Polskie_klastry/Raport_z_rekomendacjami_GRPY_nt_POLITYKI_KLASTROWEJ_PARP.pdf

² White Paper – Emerging of European World Class Clusters. Europa InterCluster, Brussels 2010, www.intercluster.eu

Living-lab – a laboratory, whose main tasks is to make available time and means for businesses-organized research (b2b model) or business with users' participation (b2c model).

Scientific-research consortium for projects realization - in the monitoring consortia should be analysed that are composed of at least 3 partners in the region, the research area of which is compliant with regional specializations, launched to realize projects of at least 1 million PLN worth.

Innovative business - in the context of Oslo methodology - this is an enterprise which in the examined period (most often of three years) has introduced at least one technological innovation: a new or enhanced product, or a new or enhanced process, being a novelty on the scale of at least this enterprise.

Innovative actions support - allocation for innovative activities in the region under Cohesion Fund for innovative activities in the years 2014-2020

Region inhabitants included in creativity and innovativeness actions - persons included in actions undertaken in the region in the scope of creating entrepreneurship as well as information and knowledge transfer.

Social capital - a collection of real and potential resources, which are related to having a lasting network of more or less institutionalized bonds based on mutual acquaintance or respect or, in other words, with membership in the group, which provides support to all its members in the form of collectively owned capital, credibility providing them access to credit in the broader sense of this word.³ In practice social capital refers to the ability to initiate social relations and to cooperate with others in order to realize tasks. Measuring social capital is related to the application of foreign indicators (social capital index) which depict the social activity of citizens: the number of associations per 1000 inhabitants, voter turnout at elections and referenda.

Knowledge capital - (intellectual capital) the value of knowledge acquired by persons and institutions located in the voivodeship. Knowledge capital may be of personalized (human capital) or public (structural capital in the form of intellectual property).

Indicator regarding the cooperation among businesses under cluster initiatives and other forms of cooperation - aggregated indicator, illustrating the involvement of cluster entities, which covers such component indicators as: percentage of business entities registered in the voivodeship, the number of innovative projects realized within clusters, the value of innovative projects realized within clusters.

Knowledge Assessment Methodology of the World Bank Institute developed into a group of indices: "Knowledge Economy Index" (KEI) and "Knowledge Index" (KI).

Knowledge-based economy indicator - "Knowledge Economy Index - KEI" is an instrument used for economic comparisons at the international level as well as for assessing the ability of economy environment to effectively apply knowledge for economic development. Among the main features of this indicator is the appropriation of particular groups of variables to specific pillars of the GOW model. After that, determining the conceptual range, normalizing sub-indicators by means of ascribing specific values (from 0 to 10 - the higher the value the more advanced the knowledge-based economy) counting partial indices, re-weighing them and in the end establishing the final indicator.

³ Bourdieu P., The Forms of Capital [in:] Richardson J. (red.), Handbook of Theory and Research for the Sociology of Education, Greenwood, New York.1985, s. 248.

Knowledge Economy Index is composed of four pillars enumerated below⁴:

- "Economic and institutional stimuli regime": customs and non-customs barriers, regulations quality, legal regulations;
- "Education and human resources": level of literacy among adults, share of people receiving secondary education as compared to total population in the age relevant for secondary schools, share of persons receiving higher education s compared to total population in the age relevant for higher education.
- "Innovation System": R&D sector researchers, patent applications approves, number of academic essays in academic and technical journals per million of citizens;
- "Information technologies": telephones per 1.000 people, computers persons 1.000 people, Internet users per 10.000 people.

Knowledge indicator "Knowledge Index - KI" is a measure determining the creation, application and diffusion of knowledge, i.e. in total covering knowledge potential in a given economy. "From the methodological perspective, knowledge indicator is the simple average of normalized results of a country or region according to key parameters of three knowledge economy pillars: education and human resources, innovation and ICT communication technologies"⁵.

3.2. Links to other strategic documents

Realization assumptions of the Regional Innovation Strategy of the Śląskie Voivodeship for the years 2013-2020 fit into the context marked out by European, domestic and regional strategic documents. The below chart enables relating strategy objectives to the objectives declared in the following documents:

- Europe 2020 (EU2020),
- Long-term National Development Strategy "Poland 2030. Third wave of modernity" („Polska 2030. Trzecia fala nowoczesności") (DSRK),
- Medium-term National Development Strategy (SSRK),
- Economy Innovation And Effectiveness Strategy (SIEG),
- Human Capital Development Strategy (SRKL),
- Social Capital Development Strategy (SRKS),
- "Energetic and Environmental Safety" Strategy (SBES)
- Development Strategy of the Śląskie Voivodeship "Śląskie 2020" (SL2020).

⁴ More on this topic, see: C. Dahlman, The Four Pillars of the Knowledge Economy. World Bank Institute, Washington D.C. 1999.

⁵ KI and KEI Indexes, www.worldbank.org/kam.

Śląskie RIS objectives	EU2020*	DSRK**	SSRK	SIEG	SRKL	SRKS	SBES	SL2020
1.1. Supporting changes in innovative communities, strongly cooperating with knowledge and information creation centres on the global scale.	1 5		II.3	C.1	5.6			A.2 A.3 C.3
1.2. Reaching perfection in the field of medical services, realized in a partnership of clinical centres, high-technology, research and innovation units of businesses, including medical and biotechnological engineering	1 3 6	KD.10			4.3			A.3 B.1 C.1 C.3
1.3. Network coo-creation and co-usage of research infrastructure by academic entities, universities, businesses and public utility institutions	1 3 5	KD.14	III.2.			C.1		A.3 C.3
1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services	1 5		II.1	C.4				A.2 A.3
1.5. Multiplication of knowledge, skills and competence of entities creating the innovation ecosystem	1 2 6		II.3	C.2	5.9	C.3		A.1
2.1. Co-creation of competence centre network for the development of smart markets	1 3 4 5			C.2		C.4		A.2 A.3 C.1 C.3
2.2. Raising the quality of public service network, using digitalization, especially in the medical public administration and education sectors	1 3	KD.13	II.5. III.2.		3.10 5.8			A.1 A.2 B.1 B.3
2.3. Construction of a new infrastructure of smart growth, based of low-emission technologies and energy efficiency	1 3 4 5	KD.21 22	II.2 II.6	C.3			C.2.1 2.2 3.3 3.4	A.2 A.3 C.3
2.4. High level of participation of SME sector businesses in regional and meta-regional cooperation networks, increasing its participation in smart markets	1 5			C.2		C.1		A.2 A.3
2.5. Strengthening the activity of prosumer groups	1 2 3 4 5 6	KD.21					C.2.5 2.6 3.5	A.1 A.2 A.3 C.3

*Reference to flagship projects: (1) Innovation Union, (2) ,Youth on the Move, (3) A Digital Agenda for Europe, (4) Resource Efficient and Low-Carbon Europe, (5) Industrial Policy for the Globalisation Era, (6) Agenda for New Skills and Jobs

** Reference to key decisions

3.3. Framework financial arrangement

The logic of strategy realization is connected with the perspective of market mechanism operation with public intervention. It is assumed that a group of activities exist, the realization of which requires necessarily and only a developmental impulse in the form of: settling them in region's policy, building positive atmosphere and support in establishing relations and mobilizing capital available on the market. At the same time another group of activities - by the insight into e.g. the seed character of an idea and the need to disseminate it, significant realization risk, insignificant forecast rate of direct return on capital - requires a direct financial supply form public funds. This assumption is the basis for the framework financial arrangement for strategy implementation, proposed below.

Having in mind the hitherto experiences in innovative policy realization in Poland and in the Śląskie Voivodeship as well as the forecasts regarding the future scale of burdens to the budgets of the central government, regional governments and locals government, it should be assumed that a desired and most realistic financial scheme catalysing innovative processes will be an external means - based scheme. In this context the key issue becomes to correlate the proposed strategic arrangement with the implementation mechanisms of those European funds which are assigned for research and innovativeness development policy and coherence policy. Programming those policies for the years 2014-2020 is currently in a critical phase both at the level of the European Union and its bodies and in the country and region. Therefore, the content of this sub-chapter should be updated and particularised in the late 2013/ early 2014 year.

The financial arrangement of the strategy implementation was decomposed in relation to the assumed strategic objectives and meta-measures. Every time in detailed statements a reference is made to the components of Horizon 2020, this relates to the provisions of the proposed Regulation of the European Parliament and of the Council on establishing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020) of 30/11/2011. Every time the objectives of the European coherence policy, this relates to thematic objectives, indicated in art. 9 of the proposed Regulation of the European Parliament and of the Council establishing European Regional Development Fund, European Social Fund, European Agricultural, European Agricultural Fund for Rural Development and European Maritime and Fisheries Fund [...] of 06/10/2011. At the same time, the cohesion of this elaboration with the assumptions of the Ministry of Regional Development on programming of the implementation of structural funds in Poland for the years 2014-2020, published until June 2012. The instructions regarding the financing of the Regional Innovation Strategy of the Śląskie Voivodeship are covered in subsequent charts, depicting the possibilities of financing types of operations characteristic for the defined objectives and possibilities for mounting financing sources for meta-measures.

Śląskie RIS objectives	Flagship financing mechanisms	Financing source	Flagship operation types
1.1. Supporting changes in innovative communities, strongly cooperating with knowledge and information creation centres on the global scale.	Horizon 2020: objectives Ib, Ic, IIa, IIc, IIIa-f	<ul style="list-style-type: none"> The budget of Horizon 2020 programme Private co-financing 	International cooperation between companies and research institutions in the R&D area
	NCBiR (National Centre for Research and Development) competitions and programmes	<ul style="list-style-type: none"> State budget Private co-financing 	R&D projects of companies and research institutions
	Coherence policy: objective 1.	<ul style="list-style-type: none"> Operating programmes at the country level Regional operating programme Co-financed from the region's budget 	International promotion of the region's research potential and support in initiating contacts
1.2. Reaching perfection in the field of medical services, realized in a partnership of clinical centres, high-technology, research and innovation units of businesses, including medical and biotechnological engineering	Horizon 2020: objectives Ib, Ic, IIIa	<ul style="list-style-type: none"> The budget of Horizon 2020 programme 	Mobility programmes aimed at scientific development
	Coherence policy: objectives 8 i 10	<ul style="list-style-type: none"> Regional operating programme Co-financing public sector institutions and private 	mobility programmes aimed at the development of professional competences
	Horizon 2020: objective Id	<ul style="list-style-type: none"> The budget of Horizon 2020 programme Co-financing public sector institutions and private 	Investing in reference infrastructure
	Coherence policy: objective 1.	<ul style="list-style-type: none"> Operating programmes at the country level Regional operating programme Co- financing from the budget of the region and private 	Investing in reference infrastructure
	Owners' proprietary investments	<ul style="list-style-type: none"> Hospital founding bodies 	Investing in reference infrastructure
	National Science Centre competitions	<ul style="list-style-type: none"> State budget 	Fundamental research projects
	National Centre for Research and Development competitions	<ul style="list-style-type: none"> State budget Private co-financing 	R&D projects of companies and research institutions
	Horizon 2020: objectives Ib, IIa	<ul style="list-style-type: none"> The budget of Horizon 2020 programme Private co-financing 	R&D projects of companies and research institutions

Śląskie RIS objectives	Flagship financing mechanisms	Financing source	Flagship operation types
1.3. Network coo-creation and co-usage of research infrastructure by academic entities, universities, businesses and public utility institutions	Coherence policy: objectives 1 i 8	<ul style="list-style-type: none"> Regional operating programme Co-financed from the region's budget 	Cataloguing the potential and the R&D infrastructure of the region: offer promotion, support for initiating contacts
	Coherence policy: objective 1.	<ul style="list-style-type: none"> Regional operating programme Co-financed from the region's budget 	Animating the creation of network and consortium projects
	Coherence policy: objectives 1 i 8	<ul style="list-style-type: none"> Operating programmes at the country level Private co-financing 	Consortium research projects with an investment component
	National Science Centre (NCN) competitions and programmes	<ul style="list-style-type: none"> State budget 	Consortium projects of fundamental research with an investment component
	NCBiR (National Centre for Research and Development) competitions and programmes	<ul style="list-style-type: none"> State budget Private co-financing 	R&D projects of companies and research institutions with an investment component
	Horizon 2020: objectives Id, IIa, IIIa-f	<ul style="list-style-type: none"> The budget of Horizon 2020 programme Co-financing public sector institutions and private financing 	Investments in infrastructure
	Consortium investments	<ul style="list-style-type: none"> Public-private partnerships of science and business 	Investments in infrastructure

Śląskie RIS objectives	Flagship financing mechanisms	Financing source	Flagship operation types
1.4. Internationalization of SME sector via specialization of innovativeness support institutions' services	Coherence policy: objective 3.	<ul style="list-style-type: none"> Operating programmes at the country level Private co-financing 	Advisory services in the area of legal and market analyses
	Coherence policy: objective 8.	<ul style="list-style-type: none"> Regional operating programme Private co-financing 	Group coaching in the area of change management and internationalizing companies
	Coherence policy: objective 3.	<ul style="list-style-type: none"> Operating programmes at the country level Private co-financing 	Building international relations
	Coherence policy: objective 3.	<ul style="list-style-type: none"> Operating programmes at the country level Private co-financing 	Export promotion
	Horizon 2020: objective IIc	<ul style="list-style-type: none"> The budget of Horizon 2020 programme Private co-financing 	MSE cooperation for innovation
	Coherence policy: objective 10.	<ul style="list-style-type: none"> Regional operating programme Private co-financing 	Training in the area of international competence
	Coherence policy: objective 10.	<ul style="list-style-type: none"> Regional operating programme Private co-financing 	Training in the field of leading trends in fields and sectors of economy in the world
	Coherence policy: objective 10.	<ul style="list-style-type: none"> Regional operating programme Private co-financing 	Language courses
1.5. Multiplication of knowledge, skills and competence of entities creating the innovation ecosystem	Coherence policy: objective 10.	<ul style="list-style-type: none"> Regional operating programme Private co-financing 	Lifelong learning educational paths
	Coherence policy: objective 10.	<ul style="list-style-type: none"> Regional operating programme 	Education programmes in secondary schools
	Coherence policy: objective 10.	<ul style="list-style-type: none"> Operating programmes at the country level 	Education programmes at universities
	Coherence policy: objective 8.	<ul style="list-style-type: none"> Regional operating programme 	Research and analyses of the state and perspectives of the labour market

Śląskie RIS objectives	Flagship financing mechanisms	Financing source	Flagship operation types
2.1. Co-creation of competence centre network for the development of smart markets	Coherence policy: objective 1.	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Regional co-financing • Co-financing public sector institutions and private financing 	Organisation, coordination and disseminating activity of the Scientific-Research Competence Centres
	Horizon 2020: objectives IIIa-f	<ul style="list-style-type: none"> • The budget of Horizon 2020 programme • Co-financing public sector institutions and private financing 	Organisation, coordination and disseminating activity of the Scientific-Research Competence Centres
	Coherence policy: objectives 2 and 4 -7	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Co-financed from the region's budget • Co-financing public sector institutions and private financing 	Disseminating activity of the Scientific-Research Competence Centres
	Coherence policy: objective 1.	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Co-financed from the region's budget • Co-financing public sector institutions and private financing 	Organisation, coordination and disseminating activity of the Functional-Operative Competence Centres
	Horizon 2020: objectives IIIa-f	<ul style="list-style-type: none"> • The budget of Horizon 2020 programme • Co-financing public sector institutions and private financing 	Organisation, coordination and disseminating activity of the Functional-Operative Competence Centres
	Coherence policy: objectives 2 and 4 -7	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Co-financed from the region's budget • Co-financing public sector institutions and private financing 	Disseminating activity of the Functional-Operative Competence Centres

Śląskie RIS objectives	Flagship financing mechanisms	Financing source	Flagship operation types
2.2. Raising the quality of public service network, using digitalization, especially in the medical public administration and education sectors	Coherence policy: objective 2.	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Co-financed from the region's budget • Co-financing public sector institutions and private financing 	Development of public e-services
	Domestic thematic programmes within the digitalization of the State	<ul style="list-style-type: none"> • State budget • Financing by governmental agendas etc. 	Development of public e-services
	Coherence policy: objective 9.	<ul style="list-style-type: none"> • Regional operating programme • Co-financed from the region's budget 	Development of public e-services
	Coherence policy: objective 2.	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Co-financed from the region's budget • Co-financing public sector institutions and private financing 	Increasing access to public e-services
	Domestic thematic programmes within the digitalization of the State	<ul style="list-style-type: none"> • State budget • Financing by governmental agendas etc. 	Increasing access to public e-services

Śląskie RIS objectives	Flagship financing mechanisms	Financing source	Flagship operation types
2.3. Construction of a new infrastructure of smart growth, based of low-emission technologies and energy efficiency	Coherence policy: objective 1.	<ul style="list-style-type: none"> • Operating programmes at the country level • Co-financed from the region's budget • Co-financing public sector institutions and private financing 	Investing in infrastructure applied in R&D projects
	NCBiR competitions and programmes	<ul style="list-style-type: none"> • State budget • Private co-financing 	R&D projects of companies and research institutions with an investment component
	Horizon 2020: objectives Id, IIa, IIIc-e	<ul style="list-style-type: none"> • The budget of Horizon 2020 programme • Co-financing public sector institutions and private financing 	R&D projects of companies and research institutions with an investment component
	Coherence policy: objectives 4 -7	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Co-financed from the region's budget • Co-financing public sector institutions and private financing 	Investing in infrastructural projects of pilot, small-scale etc. nature
	Domestic thematic programmes related to ensuring energetic safety	<ul style="list-style-type: none"> • State budget • Financing by governmental agendas etc. • Co-financing public sector institutions and private financing 	Investing in infrastructural projects of pilot, small-scale etc. nature
	Consortium investments	<ul style="list-style-type: none"> • Public, private and public-private partnerships 	Investments in infrastructure
2.4. High level of participation of SME sector businesses in regional and meta-regional cooperation networks, increasing its participation in smart markets	Coherence policy: objective 3.	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Private co-financing 	Incubation of networks in prospective technological directions.
	Coherence policy: objectives 1 i 3	<ul style="list-style-type: none"> • Operating programmes at the country level • Regional operating programme • Private co-financing 	Supporting the development of the existing networks and clusters
	Horizon 2020: objectives IIc, IIIa, IIIc-f	<ul style="list-style-type: none"> • The budget of Horizon 2020 programme • Private co-financing 	Supporting the development of the existing networks and clusters

Śląskie RIS objectives	Flagship financing mechanisms	Financing source	Flagship operation types
2.5. Strengthening the activity of prosumer groups	Coherence policy: objectives 2, 4, 7	<ul style="list-style-type: none"> Operating programmes at the country level Regional operating programme Co-financed from the region's budget Co-financing public sector institutions and private financing 	Disseminating prosumerism
	Horizon 2020: objectives IIIa -f	<ul style="list-style-type: none"> The budget of Horizon 2020 programme Co-financing public sector institutions and private financing 	Disseminating prosumerism
	Coherence policy: objectives 2, 4, 7	<ul style="list-style-type: none"> Regional operating programme Co-financed from the region's budget Co-financing public sector institutions and private financing 	Creating regional prosumer standards

The mechanism of financing	Śląskie RIS meta-measure.						
	1	2	3	4	5	6	7
	The Śląskie Academy	The cooperation of cluster initiatives and innovative communities	Realization of pilot actions within regional specializations	Labour market foresight	Regional pro-innovation fund	Design Silesia	Cooperation with neighbouring regions for innovation
Key project							
Cohesion policy							
Objective 1.	X	X	X		X		X
Objective 2.			X				X
Objective 3.		X	X		X	X	X
Objective 4.			X				X
Objective 5.			X				X
Objective 6.			X				X
Objective 7.			X				X
Objective 8.		X		X			
Objective 9.			X	X			
Objective 10.		X		X		X	X
Horizon 2020							
Objective Ib	X						X
Objective Ic	X						X
Objective Id	X						X
Objective IIa	X						X

	Śląskie RIS meta-measure.						
	1	2	3	4	5	6	7
Objective IIb					X		
Objective IIc		X	X			X	
Objective IIIa	X	X	X				X
Objective IIIb	X	X	X				X
Objective IIIc	X	X	X				X
Objective IIId	X	X	X				X
Objective IIIe	X	X	X				X
Objective IIIf	X	X	X				X
Inne programy publiczne	X	X	X	X			X
Domestic co-financing - from the State budget and its agendas budgets	X	X	X				X
Regional co-financing - from the budget of the region	X	X	X	X	X	X	X
Private co-financing	X	X	X			X	X

Annexe 1. The Śląskie Voivodeship against the background of the country - the profile of the region

The chart below compiles the most important statistical data about the Śląskie Voivodeship for the initial years of the creation of the Regional Innovation Strategy of the Śląskie Voivodeship for the years 2003-2013 and the Regional Innovation Strategy of the Śląskie Voivodeship for the years 2013-2020.

Indicator	The Śląskie Voivodeship		Country=100		Position in the country	
	2001	2010	2001	2010	2001	2010
GENERAL VOIVODESHIP PROFILE						
Area in km ²	12.294	12.333	3,9 %	3,9 %	14	14
Total population	4741,8	4635,9	12,4%	12,1%	2	2
Population density person/km ²	386	376	122*	122*	1	1
degree of urbanisation in %	79,1	78,0	61,8*	60,9*	1	1
total GDP in million PLN, including:	104.242	b.d.	13,4	b.d.	2	b.d.
per 1 inhabitant in PLN	21.908	b.d.	107,5	b.d.	2	b.d.
Total working, in thousands	1.686,1	1.637,3	11,51 %	11,9 %	2	2
Production sold of industry, in million PLN, including:	84.174,8	182501,4	16,8 %	18,5%	2	2
per 1 inhabitant in PLN	17.715	39345	12.960*	25813* (152,4 %)	2	1
Electrical power production in GWh	29897,7	32604,7	20,5 %	20,7%	2	1
Investment expenditure (current prices) in million PLN:	12573,1	26304,5	10,4 %	12,1 %	2	2
per 1 inhabitant in PLN	2.646,1	5671,0	3.141*	5690,1*	5	5
Hard-surfaced public roads per 100 km ² in km	158,4	172,4	79,4*	87,6*	1	1
Standard gauge railway lines in operation per 100 km ² of total surface in km	15,3	17,5	6,4*	6,4*	1	1
Passenger cars registered per 1000 people	273,6	440,4	272*	451,3*	7	9

Indicator	The Śląskie Voivodeship		Country=100		Position in the country	
	2001	2010	2001	2010	2001	2010
NATIONAL ECONOMY ENTITIES						
Entities of national economy per 10.000 people	850	974	887*	1.024*	11	8
Entities of national economy registered in REGON register including, in %:	403.004	451.635	12,1 %	11,6 %	2	2
Public sector total	14.595	16.551	13,2%	13,6%	1	1
Public sector - state enterprises	294	19	14,3 %	7,7 %	2	4
Public sector - trade companies	744	584	13,96 %	12,47 %	2	2
Public sector - trade companies with the participation of foreign capital	30	17	15,79 %	16,35 %	2	2
Private sector total	388.409	435.084	12,08 %	11,49%	2	2
Private sector - natural persons operating business enterprises	314.777	342.941	12,11 %	11,65 %	2	2
Private sector - trade companies including:	18.860	32.225	10,98 %	10,80 %	2	2
Private sector - trade companies with the participation of foreign capital	3.850	5.612	8,45 %	8,23 %	4	4
Private sector - cooperatives	1.279	1.162	6,80 %	6,77 %	5	4
NATIONAL ECONOMY ENTITIES REGISTERED IN REGON REGISTER PER SIZE CLASS						
Total	417.945**	451.635	12,05 %**	11,55 %	2**	2
0-9 persons employed	395.413**	425.614	11,97 %**	11,46 %	2**	2
10-49 persons employed	18.201**	21.807	13,84 %**	13,50 %	2**	2
50-249 persons employed	3.597**	3.611	12,45 %**	12,15 %	2**	2
250-999	603**	521	13,40 %**	12,92 %	2**	2
1.000 and more	131**	82	13,91 %**	10,11 %	2**	2

Indicator	The Śląskie Voivodeship		Country=100		Position in the country	
	2001	2010	2001	2010	2001	2010
INDUSTRIAL PROPERTY PROTECTION, PATENT STATISTICS						
Domestic inventions submitted	392	436	17,8	13,6 %	2	2
Patents granted	171	233	20,1	16,8 %	2	2
Domestic utility models:						
submitted	no data available	170	no data available	19,3 %	no data available	1
protective rights granted	no data available	90	no data available	18,6 %	no data available	2
INNOVATIVE ACTIVITY OF BUSINESSES IN INDUSTRY AND SERVICES						
Industrial innovative businesses per size classes (in % of total businesses)						
Total	no data available	20,32	no data available	17,10*	no data available	2
10-49	no data available	12,17	no data available	9,62*	no data available	1
50-249	no data available	33,19	no data available	30,18*	no data available	4
250 and more	no data available	60,76	no data available	58,99*	no data available	7
Expenditure on innovative activity in industrial businesses according to innovative activity financing sources (current prices), in thousands PLN						
in industrial businesses total, including funds:	1959356	4.037.838	17,0 %	17 %	no data available	2 ^a
own	1.046.219	3.557.366	71,9 %*	19,9 %	no data available	2 ^a
budgetary	41.907	30.677	1,5*	11,33 %	no data available	4 ^a
acquired from abroad	13.465	149.945	2,7 %*	7,98 %	no data available	4 ^a
bank credits	388.525	232.849	17,7 %*	11,14 %	no data available	2 ^a
in service sector businesses	no data available	591.906	no data available	5,49 %	no data available	2 ^a

Indicator	The Śląskie Voivodeship		Country=100		Position in the country	
	2001	2010	2001	2010	2001	2010
Active foreign licenses (in a given year they have a valid, in whole or in part, license agreement) in the industry (regarding entities with the number of workers >49)	25	143	9,6 %	11,8 %	4	
MODERN EQUIPMENT AND INFORMATION TECHNOLOGIES OF BUSINESSES						
Businesses that own/use a local area computer network (LAN)	629	74,0 %	12,7	71,5*	1	4
Businesses using Internet access:						
Total	792	95,8 %	12,2	95,8*	1	10
including ones with own websites	559	67,7 %	11,9	65,5*	1	3
Using Internet by industrial businesses (in absolute values):						
monitoring the market via Internet	455	no data available	12,5	no data available	1	no data available
performing marketing via Internet	326	no data available	12,0	no data available	1	no data available
making available information via Internet (product catalogues, price lists, etc.)	416	48,8 %	12,0	48,8 %*	1	8
purchasing products and services via Internet	91	no data available	11,8	no data available	1	no data available
Equipping households in PCs, in % of total households	18,6	67,2	18,4*	64,9*	7	4

Indicator	The Śląskie Voivodeship		Country=100		Position in the country	
	2001	2010	2001	2010	2001	2010
R&D ACTIVITY						
Entities in research and development activity (Research and Development activity of an entity per institutional sectors)						
Total	116	234	12,6 %	13,2 %	2	2
in businesses sector	90	175	15,0 %	14,2 %	2	2
Employed in research and development activity (R&D), including:	11.760	11699	9,5%	9,0%	3	4 ^a
with professor title	654	794	7,6%	7,7%	5	5 ^a
with PhD/Assistant Professor (dr hab.) degree	809	1137	8,1%	8,7%	4	4 ^a
with PhD degree	3.760	4449	10,8%	9,6%	3	3 ^a
Employed in R&D per 1,000 working people in total,	3,8	3,5	4,5*	4,6*	5	8 ^a
including academic-research workers	2,8	2,6	3,3*	3,7*	5	8 ^a
Gross domestic expenditure on R & D (GERD) (current prices) in million PLN:	405,2	848,8	8,3%	8,1 %	3	3
per 1 inhabitant in PLN	84	183	126*	273*	7	8
per 1 employed person (in thousands PLN)	no data available	72,6	no data available	80,3*	no data available	8 ^a
ratio to GDP in %	0.39 ratio to GDP in % in the year 2001	0.55 ratio to GDP in % in the year 2009 ***	0,65*	0,68* , ***	9	7***
GERD/ internal expenditure on R&D activity, in %:						
current spending	79,3	71,8	8,2 %	7,9%	3	3
investment	20,7	28,2	8,7%	8,9%	4	4

Indicator	The Śląskie Voivodeship		Country=100		Position in the country	
	2001	2010	2001	2010	2001	2010
GERD/ internal expenditure on R&D activity per financing sources in millions PLN, including (in %:)	405,2	848,8	8,3%	8,1%	3	3
budgetary funds	55,9	59,7	64,8* 7,2%	60,9* 8,0 %	12	10
funds of Polish Academy of Sciences units and R&D entities	0,4	no data available	0,3* 12,2%	no data available	2	no data available
university funds	0,4	2,0	0,2* 18,4%	2,5* 6,5%	2	6 ^a
company funds	11,9	27,6	9,2* 10,8%	24,4* 9,2%	1	4
funds of private non-profit institutions	0,0	0,4	0,3* 1,0%	0,3* 11,6%	6	1 ^a
foreign funds:	1,2	10,2	2,4* 4,1%	11,8* 7,0%	9	9 ^a
own funds	30,0	no data available	22,8* 11,0%	no data available	6	no data available
GERD/ Internal current expenditure on R&D activity per research types, total in thousand PLN, including in %:	321294,7	609725,4	8,2	7,9	3	3
fundamental research	24,8	26,6	5,4*	5,3	5	5 ^a
applied research	27,3	24,5	8,8*	9,4	2	2
development works	47,9	49,0	10,8*	9,7	2	2
Scientific-research equipment regarded fixed assets						
gross values (current standard prices), in in thousand PLN	288.662,1	619864,5	9,0%	7,7 %	4	5
attrition rate indicator	74,1%	73,1%	71,2*	75,2*	2	10 ^a
income, in thousand PLN	31.833,9	no data available	5,75 %	no data available	5	no data available

Indicator	The Śląskie Voivodeship		Country=100		Position in the country	
	2001	2010	2001	2010	2001	2010
HIGHER EDUCATION:						
Schools	33	45	9,9	9,9	2	2
Out-of-town units	19	39	15,7	13,4	1	1
Academic teachers	8.345	9.770	9,9	9,6	3	3
Students	192.580	181.346	11,3	9,98	2	3
Graduates	33.208	48.783	11,02 %	10,28	2	2

* domestic indicator

** for the year 2002

*** for the year 2009

"a" position in the country does not include some voivodeships, the data on which are deemed confidential statistical data within the meaning of the Act on public statistics

Sources: Central Statistical Office Local Data Bank, Annual Statistical Reports of Tax Office in Katowice, Central Statistical Office Annual Statistical Reports for Voivodeships, Central Statistical Office Science and Technology Annual Reports, direct information from the Central Statistical Office, Innobservator Silesia database.

Annexe 2. Participants of works on the strategy

Members of the RIS Research Team, representing the partners of the system project "Management, implementation and monitoring of the Regional Innovation Strategy for the Śląskie Voivodeship" („Zarządzanie, wdrażanie i monitorowanie Regionalnej Strategii Innowacji województwa śląskiego”):

University of Economics in Katowice

- Jan Pyka - team manager
- Marcin Baron
- Bogumił Szczupak

The Śląskie University of Technology:

- Jan Brzóska
- Lilla Knop
- Sławomir Olko
- Arkadiusz Szmal

The Marshal's Office of the Śląskie Voivodeship:

- Jarosław Wesołowski – task coordinator
- Barbara Bujnowska-Sęda
- Anna Jedynak
- Bogumiła Kowalska
- Monika Ptak-Kruszelnicka

The Central Mining Institute:

- Jan Bondaruk
- Anna Siwek-Skalny
- Elżbieta Uszok

The Science and Technology Park "Technopark Gliwice":

- Jacek Kotra
- Mateusz Góra

Scientific experts:

- Leszek Blacha
- Henryk Dźwigoł
- Teresa Kraśnicka
- Jerzy Świder
- Mariusz Kruczek
- Joanna Machnik-Słomka
- Krystyna Mitręga-Niestrój
- Aleksandra Czarnowska

Field experts:

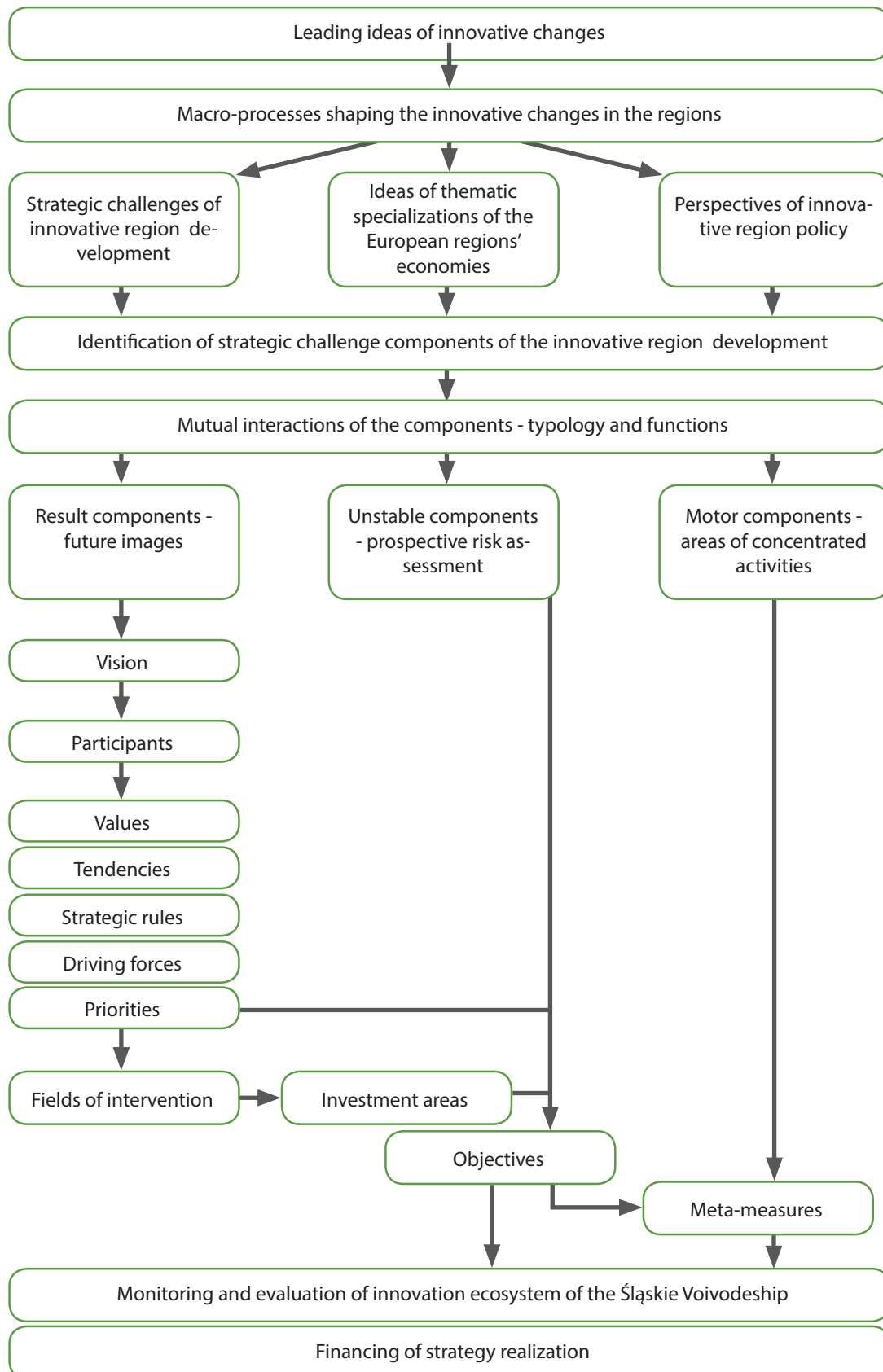
- Mirosław Bobrzyński
- Barbara Daniel
- Tadeusz Donocik
- Krzysztof Görlich
- Stanisław Grygierczyk
- Bogusław Holeksa
- Bronisława Kowalak
- Jacek Łęgiewicz
- Marta Macełko
- Izabela Mendel
- Luk Palmen
- Anna Rąplewicz
- Piotr Wojaczek

Opinion-giving and consulting groups:

- Fourth term Śląskie Voivodeship local government assembly
- Regional Innovation Strategy Steering Committee
- The Śląskie Council of Innovation
- Participants of thematic seminars
- Participants of workshops devoted to identifying enterprises
- Participants of public consultations

Annexe 3. Methodological note

The works for elaborating the Regional Innovation Strategy of the Śląskie Voivodeship for the years 2013-2020 were conducting based on the methodological assumptions illustrated in the below diagram:



As a result of investigations, performed under the project "Management, implementation and monitoring of the Regional Innovation Strategy of the Śląskie Voivodeship" („Zarządzanie, wdrażanie i monitorowanie Regionalnej Strategii Innowacji”), realized during subsequent editions since the year 2009, co-financed from the funds of the Human Capital Operational Programme, components of the identified strategic challenges of the innovative development of the Śląskie Voivodeship were defined as in the chart below:

Strategic challenges	Component challenges
Risk management in financing innovative activity	Financing innovative activity
	Diversification, transfer and containment of risk involved with financing innovative activity
	Absorption of financial instruments for increasing innovative ability of businesses
Stimulating innovative potential of capital groups and industrial corporations	Innovative potential of large companies
	Scope and scale of innovative activity of large businesses
	Scope and scale of SME cooperation in networks around large businesses and in capital groups
	Participation in network as a source of increasing SME innovative ability
Elimination of information asymmetry in the regional innovation system - knowledge management in the system of public support for innovation	Learning and application knowledge flow in networks
	Development of competence for creating and implementation of innovation in enterprises and institutions
	Integration of knowledge and information about innovation development in the region
Diffusion of innovation in the public services sector	Acceleration of technological change in providing public services
	Acceptance of technologically advanced public service standards
	Creation of demonstrative effects
	Networking the participants of the process of innovative provision of public services.
Development of knowledge economy infrastructure	Creating new knowledge economy infrastructure investments
	Restructuring the application of the existing knowledge economy infrastructure
	Competence and cooperation of research groups
	Pro-innovative education system
Creating smart markets for future technology	Innovative partnerships in entrepreneurship communities
	Smart distribution networks
	Digitalization of innovative networks and a uniform digital market
	Low-emission economy
Shaping innovative culture	Innovative strategies of businesses
	New business models
	New management models

Detailed execution of the analysis of the above described strategic challenges of the innovative development of the Śląskie Voivodeship was based on the methodology of cross-impact analysis of the components of strategic challenges. It became a basis for: recognizing the function that in future might be performed by the particular components of challenges in formulating strategic assumptions of the innovative development of the Śląskie Voivodeship, as well as reducing the amounts of components for recognizing the most important and of most impact on the dynamics of innovative changes in the region.

As a result the following provisions were adopted, that determine the shape of strategic decisions described in chapter 2 and the implementation provisions described in chapter 3:

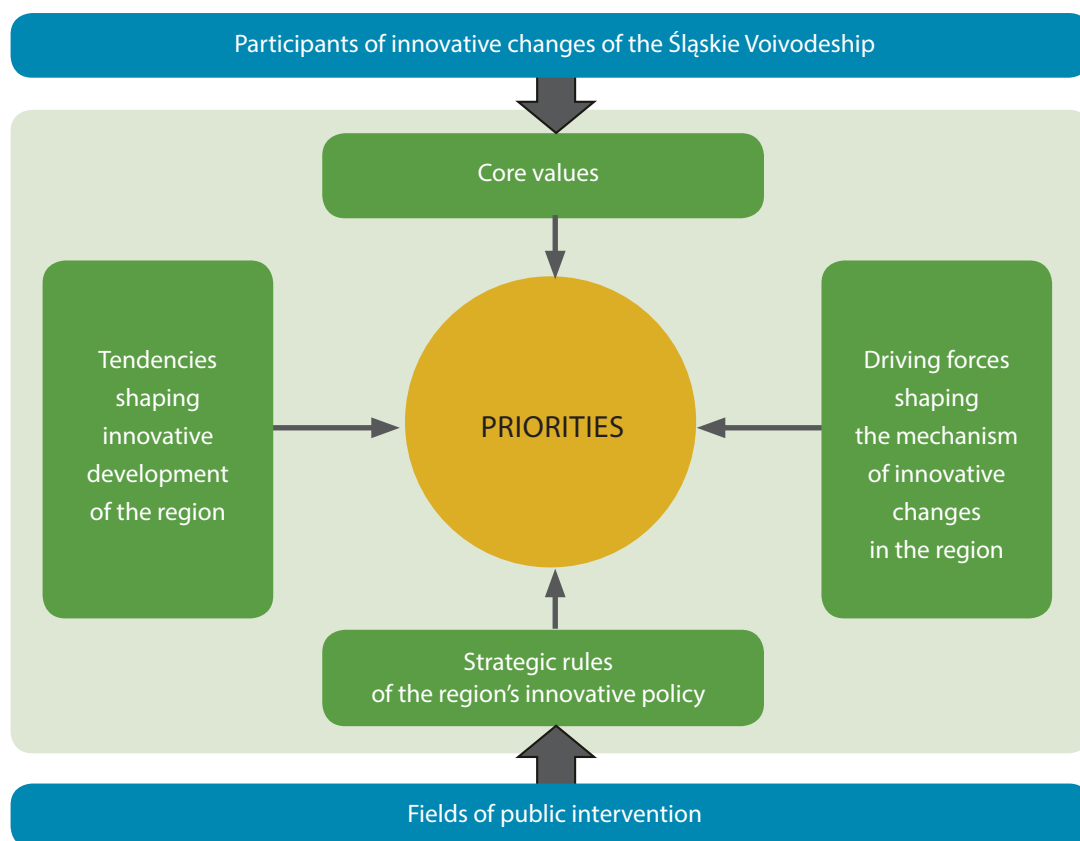
- A group of components of result nature describes the picture of the region's future and determines the main idea of the region's innovative development of the indicated vision.
- A group of components unstable type is the area of the stronger interactions and therefore the most intense interest in pursuing a policy of innovative development of the Śląskie Voivodeship. This group of factors is associated with creating driving forces of the region's innovative development. In the further analysis driving forces were distinguished related to the mechanism of public choice - areas of public intervention and driving forces related to the mechanism of market choice - areas of public support or grassroots initiatives undertaken by market participants. Moreover, the so distinguished factors were additionally analysed depending on tendencies and trends, and as a consequence this group became the fundamental group for forming strategy objectives structure.
- A group of determining components creates conditions for implementation of strategy, it is not a strictly the basis for strategic decisions but constitutes a rudiment for formulating strategies enterprises.
- Autonomous components were not included in further analyses.

The basis for formulating a vision of innovative development of the Śląskie Voivodeship was the disclosure of dynamics of innovative changes occurring and possible to occur in the future in the innovative community of the Śląskie Voivodeship. Conducting this analysis allowed for the recognition of the function which in the future might be performed by the particular challenge components for



achieving the strategic vision and on the reduction of the number of considered variables to the most important and of the strongest impact on the dynamics of innovative changes in the region.

An issue of core meaning for fully formulating the vision was to establish priorities of the development of the Śląskie Voivodeship innovation ecosystem. It combined: subject approach, related to the recognition of core values of main subjects of innovative changes in the region, and object approach, related to tendencies and driving forces shaping the region's innovative development. While creating the vision, also decisions on innovative policy concept of local authorities were made. Components of this policy include strategic policy rules and establishing the areas of public intervention in shaping innovative changes. The structure of full vision formulation is illustrated in the below diagram. Full scope of stipulations made was described in partial reports on the realization of the project "Management, implementation and monitoring of the Regional Innovation Strategy" („Zarządzanie, wdrażanie i monitorowanie Regionalnej Strategii Innowacji”).



As a result of the above depicted proceedings leading to formulating a vision of innovative development of the Śląskie Voivodeship, a reference arrangement was created for formulating strategy objectives, presented in the below diagram.

Vision		Regional innovation ecosystem of the Śląskie Voivodeship				
Priorities	Strategic areas	Knowledge and innovation communities	Public service networks	Infrastructure of the regional ecosystem of innovation	MSE in global economy chains	Talents and competences
Increasing and internal integration of the region's innovative potential						
Creating smart markets for future technology						

Next, objectives were identified and described. For each of the objectives, using workshop methods and as a result of consultations with innovative development actors of the Śląskie Voivodeship, desired strategic enterprises were assigned, which were then aggregated for the purposes of strategies to meta-measures of horizontal nature - taking into account the mutual interrelations in the processes of reaching strategic objectives. In the final phase of works for the whole strategic arrangement assumption were formulated regarding monitoring and evaluation, compliant with the national and regional system of monitoring the processes of regional development, as well as assumptions regarding financing.

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