DOCUMENT TITLE:

REGIONAL MAPPING REPORT - SLOVAKIA

Project: Improving RD and business policy conditions for transnational cooperation in the manufacturing industry

Acronym: Smart Factory Hub

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TARGET GROUP ASSESSMENT

Has this deliverable addressed any of the target group indicated in the application form?

Yes / **No**

If yes, please describe the involvement of each individual target group in the table below.

Target group	Number reached by the deliverable	Description of target group involvement
SME		
Regional public authority		
National public authority		
Higher education and research		
Business support organisation		

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1 Introduction

The objective of regional mapping is to provide insight into the current state of the manufacturing sector, particularly functioning of support environment in Slovakia from which production oriented small and medium enterprises (SME) can benefit on a long term. The regional report is drafted by following common methodology, which includes the analysis of supportive environment for manufacturing oriented companies - particularly smart specialization measures, priorities, indicators, implementation schemes, instruments, emerging trends in the manufacturing sector, analysis of existing support ecosystems and analysis of the main regional actors. Moreover, the supporting institutions and available support services are highlighted, in order to determine possible inclusion of these institutions in a common hub, and thus offer complementary services to SMEs and other target groups.

This report is provided as a single report, similar to reports from other countries, where each partner delivered mapping covering its own region. As a result, regional mapping reports are prepared for Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Romania, Serbia, Slovakia and Slovenia.

After the introduction, Chapter 2 is providing strategic background for the Smart Specialization Strategy including top-down description of strategies and status of their evolution at a national level, background analyses supporting development of strategies and highlight Smart manufacturing topics.

Chapter 3 is presenting support environment by highlighting the support environment structure, detecting actors responsible for implementation of strategies and other supporting actors like clusters, technology parks, R&D centres, competence centres, University incubators, Business incubators.

Chapter 4 presents Smart Factory support schemes and programmes including list of currently available or future programmes, grants, loans, etc.

Relevant statistical data for Slovakia manufacturing sector is presented in chapter 5.

Chapter 6 provides national Smart Factory related projects in execution by the project partner or partnering organisations.

Chapter 7 presents list of regional actors relevant for area of Smart Factory whereas actors are grouped by relevance (User, Solution provider or User/solution provider)

2 Strategic background

The Europe 2020 strategy, approved by the European Council on 17 June 2010, is a strategy for employment, smart, sustainable and inclusive growth, constituting a coherent framework to mobilise resources, policies and coordinated action. The areas of innovations and energy are the initiating policies to start the EU potential for growth. The support of growth and competitiveness and, especially, dealing with deep imbalances as well as progress in structural reforms focused on unleashing domestic growth potential, inter alia through opening the economic competition in network industries, support of digital economy, use of the potential of ecological economy, removal of unnecessary restrictions imposed to service providers and facilitation of business start is a condition to increase competitiveness of the EU in the global competition.

In accordance with the effort to support the process of increasing the competitiveness of Europe and employment, the Member States have to intensify the efforts to progress in structural reforms. Better use of the European economic and industrial potential as a basic component of the growth and competitiveness programme is crucial. A strategic objective is the implementation of policies to support technological and societal innovations using the potentially strong areas and competitive advantages of particular regions and Member States.

Such orientation of policies can unleash a growth potential of the EU by supporting the innovations in all regions and ensure complementarity among support of innovations, research and development, business and information and communication technologies on the EU, national and regional levels. In the future period of a new multiannual financial framework the regional policy will become a key tool transforming the EU innovation priorities into local practical measures, especially in transitive economies.

A basic precondition for elaboration of a smart specialisation strategy is that the Slovak Republic demonstrates its ability to strategically manage and concentrate permanently limited sources with the aim of sustainable development and develop the country in harmony with principles of smart, sustainable and inclusive growth in order to strengthen the competitiveness of the Slovak Republic and the European Union. This is why the strategy and its implementation have to comply with the principles of partnership, communication and participative preparation, approval, implementation, monitoring and evaluation of results with involvement of direct and indirect stakeholders.

Such a procedural approach has resulted in a vision, objective of which is to stimulate a structural change in the Slovak economy towards a growth based on increasing innovation ability and excellence in research and innovation in order to support sustainable growth of incomes, employment and quality of life.

The Slovak Republic is a small and very open economy. Its size is comparable to the size of regions in large EU countries. Due to this reason the concept of smart specialisation has not been applied in a formal regional dimension and remained only at national level. The presented

strategy creates conditions for development of the Slovak Republic as a whole, while respecting regional specifications.

Structural changes are necessary due to the fact that, though the Slovak Republic in the framework of the European Union belongs to the most rapidly growing economies (its gross domestic product per capita in purchasing power parity increased from 47 % of the EU27 average in 1995 to 73 % in 2012), its competitive advantage was made by low taxes and labour price. In the international comparison the Slovak Republic still belongs to the countries with the lowest innovation performance, lagging behind the EU average considerably.

Slovakia permanently lags behind in the intensity of innovation activities on the level of enterprises, in expenditures for projects of research, development and innovation resulting in practice, in transfer of technologies, in the use of cooperation potential, patent activities, in cooperation of research institutions with industry, in the use of risk capital and in a number of aspects conditioning the effective use of human resources. There is still a low level of cooperation between the institutions of science and research, education and economy in development and growth of competitiveness of the industrial basis, in connection with creation of competitive innovative products, technologies and services.

The share of knowledge-intensive services in GDP and export, compared to other countries, is very low and the use of innovative processes in the areas of creative industry and social sphere has started only recently.

Analysis of Science and Research areas in the Slovak Republic
The group of experts from universities, research institutes (including SAS), industry research institutes, representatives of the industry and industry unions was created for the analysis of the science and research. The expert group formulated three basic groups of the thematic priorities:

Research and Development priorities:
1. Material research and Nanotechnology
2. Information and Communication technologies
3. Biomedicine and Biotechnology

Technological priorities:
4. Industrial technologies
5. Sustainable Energy
6. Environment and Agriculture

Social priorities:
7. Selected areas of social sciences (with respect to the most pressing problems of the Slovak society)

Technological priorities

- Industrial technologies focusing on automation, control, robotics, as well as the technology for forming, cutting and joining of new metallic and non-metallic materials and composites, logistic technologies, processing technologies for polymers, wood and products thereof. Slovakia has about 700 employees in the field, who published more than 10% of all outputs in international scientific journals.
- Effective usable energy sources (reduction of the energy intensity, emission reduction program ALEGRO, smart grid technology, the safety of nuclear power plants, etc.). Slovakia has experiences with construction, operation and decommissioning of nuclear power plants. At the same time it also has research and training capacities. It is therefore real priority to ensure energy security of the country and finding new sustainable ways of producing electricity. Slovakia has 350 researchers in the field.
- Environment, Agriculture, Food security with a focus on advanced technologies and practices in agriculture and food production to ensure the sufficiency of quality food production. The better utilization of the forests, which cover almost 50% of the Slovak area, is a good chance together with the following processing of wood. Slovakia has about 450 researchers in this field, who produce about 9% of all outputs in international scientific journals.

2.1 Research and Innovation Strategy for Smart Specialisation of the Slovak Republic (RIS3)1

The vision of this strategy will be accomplished through strategic objectives:
1. Deepening integration and embeddedness of key major industries increasing local value added through the cooperation of the local supply chains and turning local supply chains into embedded clusters
2 Increased contribution of research to the economic growth via global excellence and local relevance
3. Creating a dynamic, open and inclusive innovative society as one of the preconditions for the increase in the standard of living
4. Improving the quality of human resources for an innovative Slovakia

Organisational scheme
The creation of the Strategy for smart specialisation of the Slovak Republic is based on essential EU8 documents and essential methodology for RIS39 creation and on the practical experience of processing complex strategic documents in the recent period in the SR10. All key relevant stakeholders were involved in the process who influenced the creation and implementation of strategy based on a principle of quadripartity (quadruplehelix). The result is a document that is a consensus created with the participation of scientists, entrepreneurs (including SMEs), business

[1] https://www.mzv.sk/documents/10182/54004/141805_poznatkami_k_prosperite_EN.pdf

clusters, academic sector, regional government structures, civil society structures and including a systematic consultation of foreign European Commission experts.

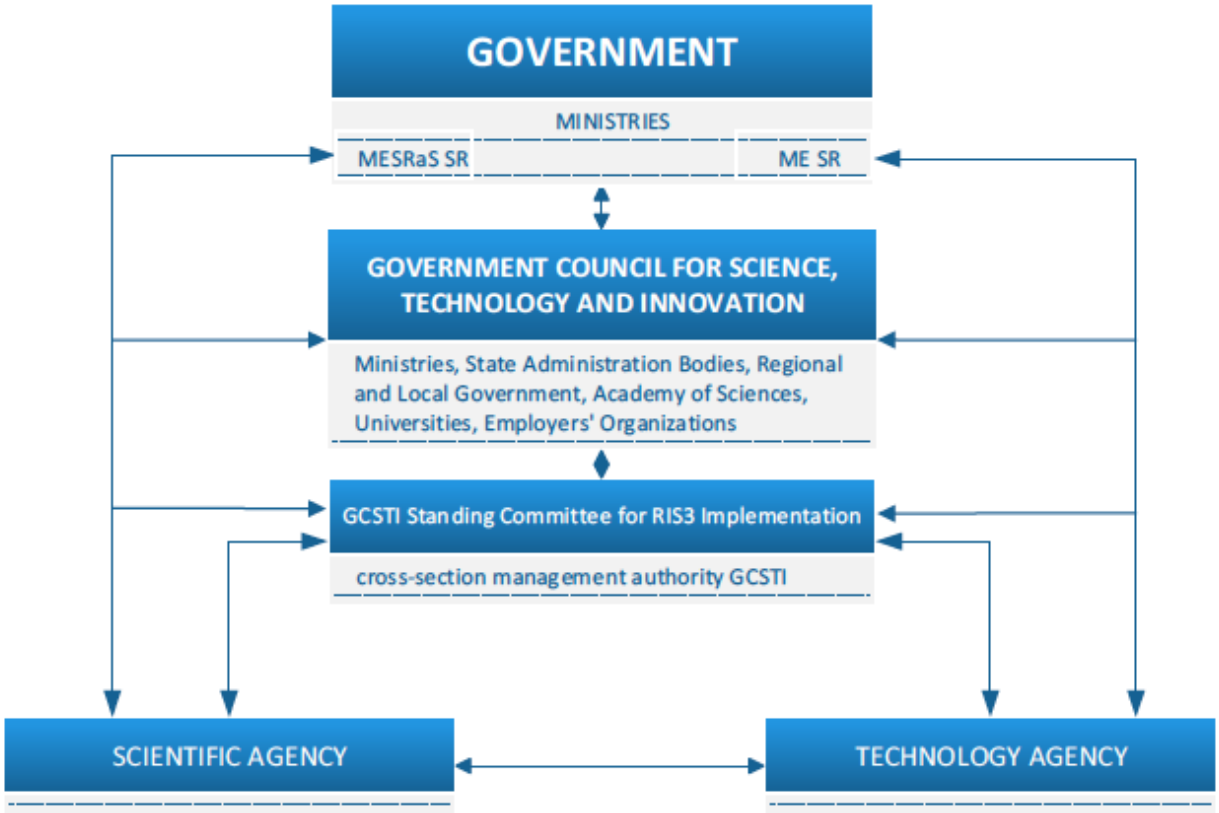

Figure 1: Organisational scheme of institutional management of Strategy of smart specialization implementation until 2020

To fulfill the RIS3 objective, there will be a change in the current system of science and innovation management that frequently acts divergently, autonomously and without a focus on key areas of development of the SR. For the RIS3 implementation the institutional management scheme will be created which will significantly strengthen the procedure of science and innovation management in the SR. The key authority for the management of RIS3 implementation is the GOVERNMENT COUNCIL FOR SCIENCE, TECHNOLOGY AND INNOVATION, which will for the effective process of RIS3 implementation establish as its working body THE STANDING COMMITTEE OF THE GOVERNMENT COUNCIL FOR SCIENCE, TECHNOLOGY AND INNOVATION FOR RIS3 IMPLEMENTATION (SC GCSTI RIS3). In line with the strategic objective of ensuring the complete and complex prioritization of science and innovation, other ministries and central state administration institutions will be involved in this process. The extent and scope of involvement will be designated by the corresponding action plan. For the sake of eliminating the current fragmentation and achieving the synergic effects, the existing network of implementation institutions will be transformed into two independent agencies: RESEARCH AGENCY and TECHNOLOGICAL AGENCY, which would be under the competence of MESRaS and ME SR. Methodically, they will be guided by the SC GCSTI and they will ensure the RIS3 implementation.

Monitoring and evaluation

One of the key conditions for fulfilling RIS3 intentions for Slovakia is a concentration of all resources of the Slovak Republic (human, material, non-material, financial) in time and space in such a way that by the year 2020 all objectives will be fulfilled. One of the important conditions for implementing the new system of management is effective monitoring, which will provide information about individual activities, identify and map the process of individual activities. It will also provide information about the advancement of partial objectives not only from the perspective of drawing financial sources, but also the eventual effect on Slovak economy.

The key aspect of RIS3 implementation will be the planned process of activities, which will be mutually interlinked and resourcefully and timely balanced. The integral part of this plan is the monitoring plan as a measurement set which evaluates the process of RIS3 implementation on individual organizational levels. The system of monitoring of the fulfillment of RIS3 objectives and priorities will be adjusted accordingly. The monitoring plan will contain a designation of measurable tools in respective stages of implementation with deadlines, organization structure that will administer the monitoring; it will state the responsibility who will review the results of the monitoring and who takes measures and corrections during the process of implementation to achieve the objectives. The plan will not only evaluate the drawing of funds and the qualification for drawing financial resources, but also factually evaluate the method for accomplishing designated RIS3 objectives. Government Council for Science, Technology and Innovation (GCSTI) is an advisory body of the Slovak government and of all materials in the R&I area from all relevant state institutions. In relation to RIS3 it is an executive body for this strategy.

GCSTI Standing Committee (GCSTI SC) as an executive body of the Government Council for Science, Technology and Innovation will be among others responsible for ensuring the monitoring. Supporting monitoring activities for the needs of SC GCSTI is done by the Analytical unit of the Government Office of the Slovak Republic.

The monitoring system of RIS3 implementation includes:

- Responsibility for methodical activities (preparation of methodological documents that establish horizontal framework for RIS3 implementation)
- Periodical reporting for the needs of GCSTI, Government of the SR, European Commission and other subjects involved in RIS3 implementation. Reporting contains reports about the state of RIS3 realization and about the contribution of measures towards the fulfillment of RIS3 objectives, as well as the contribution of the strategy to the fulfillment of the Partnership Agreement of the SR for the years 2014 – 2020,
- Formulation of suggestions for measures in case the RIS3 SK implementation does not lead to the results in a timely manner and in an intended scope
- The obligation of administrators of projects with public funding sources during the project approval to submit the separate monitoring plan of the state of project implementation and its organizational and material provision

Implementation of RIS3 SK monitoring on the executive level:

- GCSTI Standing Committee is responsible for monitoring
- Analytical Unit of the Government Office of the Slovak Republic in cooperation with central state administration bodies (especially the Ministry of Economy and the Ministry of Education, Science, Research and Sport of the Slovak Republic) monitors relevant measurable output, result and impact indicators, tools and measures for RIS3,
- Based on data from central state administration bodies, Statistical Office, other sources, annual and final reports, etc. the Analytical Unit of the Government Office of the Slovak Republic summarizes the available data and in relation to strategy as a whole processes it into implementation report on annual basis and into final RIS3 report

2.2 Strategic Document for Digital Growth and Next Generation Access Infrastructure (2014 – 2020)[2]

Encouraging economic growth, boosting competitiveness, enhancing economic with a higher value added and increasing effectiveness of public administration are among Slovakia's key priorities. The strategy presented in this document considerably contributes to accomplishing these priorities.

The present document defines a strategy for further development of digital services and next generation access infrastructure in Slovakia and focuses on the fulfilment of the ex-ante conditionalities by means of which the European Union evaluates readiness of Member States to implement investment priorities of their choice. The document particularly discusses the fulfilment of the two ex-ante conditionalities defined under thematic objective 2 "Enhancing access to and use and quality of information and communication technologies".

Priorities and specific objectives

In terms of information society development, it is the interaction with the public (in the form of services) and internal eGovernment development that should logically be addressed separately. The ongoing reform entitled "Effective, Open and Reliable Public Administration" represents an excellent opportunity in this respect.

The individual recommendations make it possible to define the basis for specific objectives.

- Services for citizens and businesses:
  - Development of electronic services;
  - Use of open data;
  - Supporting small and medium-sized enterprises in the digital economy;
  - Promoting eInclusion.
- Effective public administration:
  - Establishing the eGovernment innovation centre;
  - Promoting processes of effective public administration;

[2] www.informatizacia.sk/ext_dok-strategicky_dokument_2014_2020_en/16622c

- Introducing eGovernment cloud;
- Security

- Broadband:
  - Deployment and use of broadband

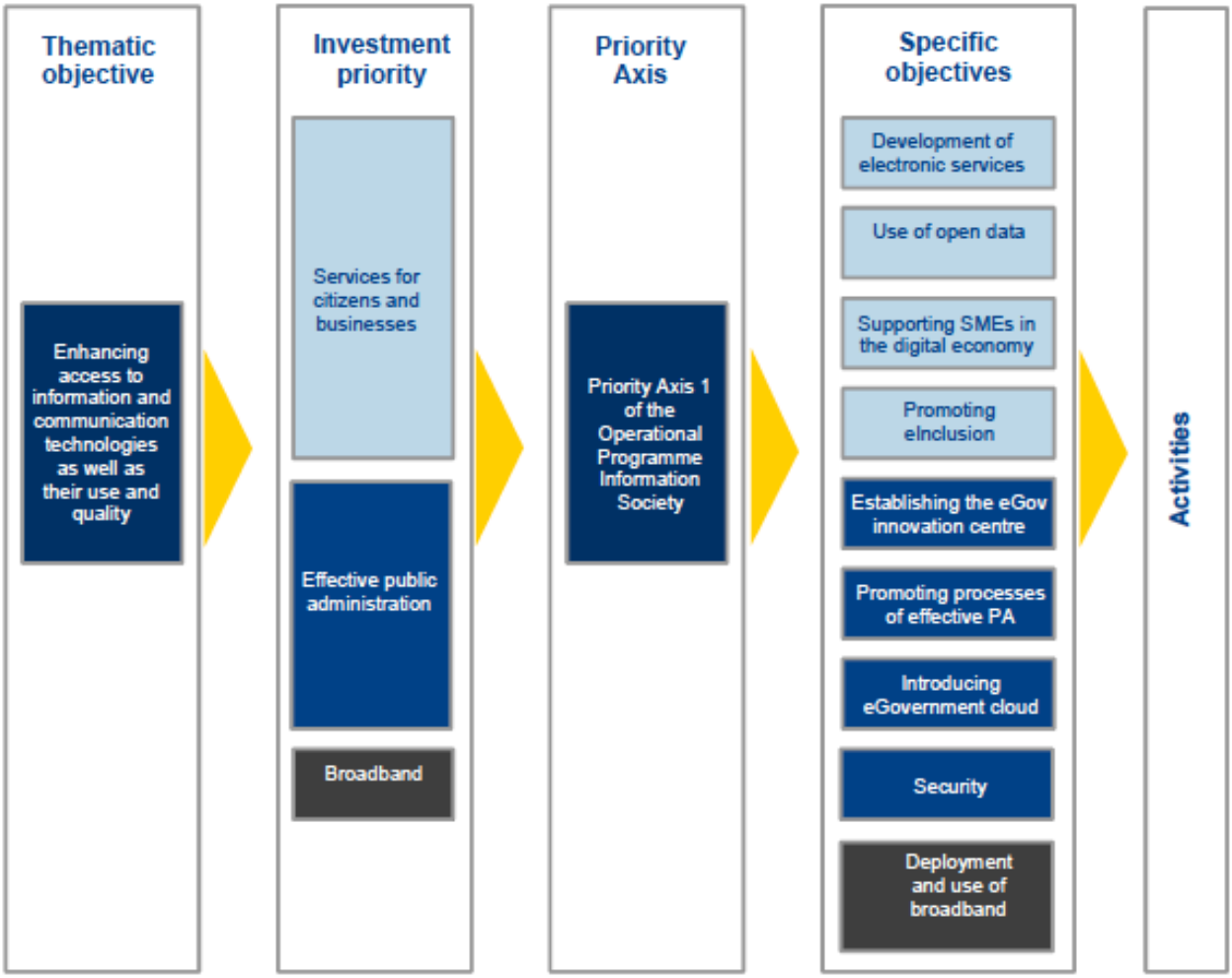

Figure 2: Proposed priorities and their specific objectives

2.3 Operational Programme Research and Innovation (2014 - 2020)[3]

The Operational Programme Research and Innovation (OP R&I) represents a joint programme document of the Ministry of Education, Science, Research and Sports of the Slovak Republic (MoESRS SR) and the Ministry of Economy of the Slovak Republic (MoE SR) for the granting of support from European Structural and Investment Funds (ESIF) during the programming period 2014–2020 in the area aimed to create a stable innovation-friendly environment for all relevant entities and to promote the efficiency and performance of the system of research, development

[3] http://www.minv.sk/?operational-programme-research-and-innovation-2014-2020

and innovations as a basic pillar for reinforcing competitiveness, sustainable economic growth and employment.

The OP R&I is based on the priorities of the Europe 2020 strategy and on the main recommendations of the Small Business Act and the Entrepreneurship 2020 Action Plan.

Areas of specialisation

The intervention strategy of the OP R&I is fully based on the RIS3 SK, as the OP R&I is its principal implementation tool. The definition of the basic lines of the intervention logics is also derived from successful activities, good practice and experience acquired during the programming period 2007–2013.

The OP R&I does not cover all activities of the RIS3 SK strategy, but only those which are in line with thematic focus of the OP. Other RIS3 SK activities will be implemented using other national instruments and funds.

Regarding global excellence, while taking into consideration local relevance for the purposes of smart specialisation, following areas of specialisation have been identified:

Areas of economic specialisation:

- Automotive and mechanical engineering industries
- Consumer electronics and electrical equipment
- ICT and Services
- Production and processing of iron and steel

Prospective areas of specialisation:

- Automation, Robotics and Digital Technology,
- Processing and increasing the value of light metals and their alloys,
- Production and processing of polymers and advanced chemical substances (including smart fertilizations
- Creative industry,
- Increasing the value of domestic raw material
- Progressive chemical technologies for production of modern fertilizers
- Support of the smart technologies in the field of raw materials processing in regions of their occurrence.

Areas of specialisation from the point of view of available scientific and research capacities:

- Research of materials and nanotechnology,
- Information and communications technology,
- Biomedicine and Biotechnology,
- Environment and agriculture,
- Sustainable energy

3 Support environment

In Slovakia supporting institutions for business oriented SMEs are chambers of commerce and industry (CCI), clusters, centres of excellence, research centres, competence centres, technology centres, technology parks, incubators and other operating in the eligible program area.

All these institutions promote the emergence of new competitive companies that promise high added value and equitable regional development. Incubators support the realization of entrepreneurial ideas, the creation and development of enterprises, stimulating environment, subsidised leases of premises and administrative, intellectual services and other services for its tenants. Technology parks in one location bringing together business development, research and operations of new technology companies, its members while offering a supportive environment consultancy, easy exchange of information, transfer of knowledge, the necessary infrastructure and the like.

3.1 Clusters

Clusters represent a form of informal networking among businesses and other organizations in the sector in a given geographical area, which offers plenty of benefits of cooperation. Connectivity is based on common interests, the basic idea of clustering is based on cooperation, including companies that have market competition, which is somewhat illogical, but understandable since it is a common interest in development cooperation, transfer of knowledge and the development of new competences.

Organizational forms of business clusters are different and depend on each cluster, scope and content. All clusters have in common is that it is a common entrepreneurial activity in a particular environment, focused on the broader global market. Companies within the cluster are specialized and complementary but competing at the same time. In this way may be associated companies acquire larger and more complex transactions that create higher added value and increase their visibility in the market. Membership and participation in the cluster of micro, small, medium and large companies makes contact with partner organizations abroad. These may be companies, institutes, universities and other organizations of interest in terms of members. Organizations and individuals to find themselves in a network of international projects and partners from all over Europe or even the world's countries.

The objective of fostering the entrepreneurial clusters is to strengthen the infrastructure established at local, regional, national and international level and support the identified clusters at a certain level. Cooperation in research and development projects, the members of the cluster enables learning, networking and the development of competencies. Companies can spend a lot of time developing and training, participate in workshops, development and innovation of business models and the like. For micro, small and medium-sized enterprises means integration into clusters, a good opportunity and solution to consolidate its position in the domestic market

and the penetration of foreign markets. Affected companies easier to overcome challenges in the areas of foreign market entry, promotion, marketing, take on larger and more complex transactions, investments, technological development, and so on.

In Europe, there are more than 2,000 different industrial clusters, of which there are about 150 of those who are among the leaders in the world in terms of focus, specialization, size and employment. Around 40% of European jobs is based on clusters; and clustering of micro, small and medium-sized enterprises leads to more innovation and growth.

Technology Cluster initiatives in Slovakia:

1. 1st Slovak Mechanical Engineering Cluster – 1.slovenský strojársky klaster

2. Automotive Cluster – Automobilový klaster

3. BITERAP Cluster – BITERAP klaster

4. Electrotechnical Cluster – Elektrotechnický klaster

5. Energy Cluster – Energetický klaster

6. Cluster AT+R – Klaster AT+R

7. Košice IT Valley Cluster – Košice IT Valley z.p.o

8. Slovak Plastic Cluster – Slovenský plastikársky klaster

9. Z@ict Cluster - Z@ict

Table 1: Clusters

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK03	1.slovenský strojársky klaster	Technology cluster	Areál PPS, 962 12 Detva	ladislav.bodi@1ssk.sk	www.1ssk.sk
SK	SK02	Automobilový klaster západné Slovensko	Technology cluster	Hlavná 5, 917 01 Trnava	chudoba@autoklaster.sk	www.autoklaster.sk
SK	SK04	BITERAP klaster	Technology cluster	Popradská 58, 040 11 Košice	peter.linhardt@finesoft.sk	www.biterap.sk
SK	SK02	Elektrotechnický klaster –západné Slovensko	Technology cluster	Z. Kodálya 769/29, 924 27 Galanta	polacek@elektroklaster.sk	www.elektroklaster.sk
SK	SK02	Energetický klaster západné Slovensko	Technology cluster	Paulínska 24, 917 01 Trnava	jozef.maudry@enks.sk	www.enks.sk
SK	SK04	Klaster AT+R	Technology cluster	Južná trieda 95, 041 24 Košice	jaromir.jezny@ztsvvuke.sk	www.clusteratr.sk
SK	SK04	Košice IT Valley z.p.o	Technology cluster	Letná 9, 040 01 Košice	miriam.braskova@tuke.sk	www.kosiceitvalley.sk
SK	SK02	Slovenský plastikársky klaster	Technology cluster	Vašinova 61, 949 01 Nitra	juraj.miskolci@spksk.sk	www.spksk.sk
SK	SK03	Z@ict	Technology cluster	Komenského 48, 011 09 Žilina	zaict@zaict.sk	www.zaict.sk
SK	SK02	Klaster cestovného ruchu – západné Slovensko	Tourism cluster	Starohájska ul. 10, 917 01 Trnava	behro.marcel@trnava-vuc.sk	
SK	SK03	Klaster LIPTOV – združenie cestovného ruchu	Tourism cluster	Štúrova 1989/41, 031 42 Liptovský Mikuláš	gemzicky@klasterliptov.sk	www.klasterliptov.sk
SK	SK03	Klaster ORAVA – združenie cestovného ruchu	Tourism cluster	Bystrecká 1255, 026 01 Dolný Kubín	marketing@orava.sk	www.orava.sk
SK	SK03	Klaster TURIEC – združenie cestovného ruchu	Tourism cluster	Nám. S. H. Vajanského 1, 036 49 Martin	klasterturiec@martin.sk	
SK	SK03	Združenie cestovného ruchu Balnea Cluster	Tourism cluster	Kúpeľná 109, 962 71 Dudince	tik@tikdudince.sk	www.tikdudince.sk
SK	SK02	PROUNION a.s.	Tourism cluster	Piaristická 2, 949 01 Nitra	info@prounion.sk	www.prounion.sk
SK	SK02	Bioeconomy Cluster	Technology cluster	Piaristická 2, 949 01 Nitra	info@bioeconomy.sk	www.bioeconomy.sk

Furthermore there is existing technology network:

1. Union of Slovak Clusters (Únia klastrov Slovenska)

Table 2: Technology Network

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK02	Únia klastrov Slovenska	Cluster Union	Piaristická 2, 949 01 Nitra	juraj.miskolci@spksk.sk	www.uksk.sk

3.2 Centres of excellence

Centres of Excellence are a measure within the framework of the scientific and technology policy of the Slovak Republic aimed at promoting the concentration of knowledge at priority technological areas and horizontal linking along the entire chain of knowledge development, which is realised on the basis of strategic partnerships between the private sector and academia. This comprehensive inter-disciplinary research and development programme emphasises the

horizontal objective of promoting the transition to an energy-efficient economy with low greenhouse gas emissions or strongly promoting the transition to a low-carbon society.

Eight Centres of Excellence were selected within a public call for the development of centres of excellence in 2009–2016:

1. Centre of Excellence in Security Research - Centrum excelentnosti bezpečnostného výskumu (End date – 02/2015)

2. Centre Centre of Exelence for SMART Technologies, Systems and Services - Centrum excelentnosti SMART technológií, systémov a služieb (End date – 06/2014)

3. Centre of Excellence of Five Axis Machining - Centrum excelentnosti 5-osového obrábania (End date – 12/2012)

4. Centre of Cooperation for Transfer of Innovative Technologies from Research to Practice - Centrum spolupráce pre transfer inovatívnych technológií z výskumu do praxe (CESPETIT)

5. Centre of Excellence in Complex Systems Physics - Centrum excelencie fyziky komplexných systémov

6. Centre of Excellence SlovakION - Centrum excelentnosti SlovakION (End date – 05/2016)

7. Centre of Excellence for Design, Preparation and Diagnostics of Nanostructures for Electronics and Photonics 2 - Centrum excelentnosti pre návrh, prípravu a diagnostiku nanoštruktúr pre elektroniku a fotoniku 2 (NanoNet2) (End date – 09/2014)

8. Centre of Excellence of Power Electronic Systems and Materials for Their Components - Centrum excelentnosti výkonových elektronických systémov a materiálov pre ich komponenty (End date – 05/2014)

9. International Center of Excellence for Research on Intelligent and Secure Information and Communication Technologies and Systems - Medzinárodné centrum excelentnosti pre výskum inteligentných a bezpečných informačno-komunikačných technológií a systémov (End date – 10/2015)

Table 3: Centres of Excellence

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK01	Centrum excelentnosti bezpečnostného výskumu	Centre of excellence	Vazovova 5, 812 43 Bratislava	ladislav.stibranyi@stuba.sk	http://www.stuba.sk/sk/pracoviska/projektove-stredisko/projekty-strukturalnych-fondov-eu/projekty/centrum-excelentnosti-bezpecnostneho-vyskumu.html?page_id=7312
SK	SK01	Centrum excelentnosti SMART technológií, systémov a služieb	Centre of excellence	Vazovova 5, 812 43 Bratislava	daniel.donoval@stuba.sk	http://www.stuba.sk/sk/pracoviska/univerzitny-vedecky-park-stu/centra-excelentnosti/centrum-excelentnosti-smart-technologii-systemov-a-sluzieb.html?page_id=7170
SK	SK01	Centrum excelentnosti 5-osového obrábania	Centre of excellence	Vazovova 5, 812 43 Bratislava	jozef.peterka@stuba.sk	http://www.stuba.sk/sk/pracoviska/univerzitny-vedecky-park-stu/centra-excelentnosti/centrum-excelentnosti-5-osoveho-obrabania-ce5am.html?page_id=7196
SK	SK01	Centrum spolupráce pre transfer inovatívnych technológií z výskumu do praxe CESPETIT	Centre of excellence	Vazovova 5, 812 43 Bratislava	frantisek.uherek@stuba.sk	http://www.stuba.sk/sk/pracoviska/univerzitny-vedecky-park-stu/centra-excelentnosti/centrum-spoluprace-pre-transfer-inovativnych-technologii-z-vyskumu-do-praxe-cespetit.html?page_id=7192
SK	SK01	Centrum excelencie fyziky komplexných systémov	Centre of excellence	Mlynská dolina, 842 48 Bratislava 4	sandanusova@fmph.uniba.sk	http://fyzikus.fmph.uniba.sk/cpp/cefks/index.htm
SK	SK01	Centrum excelentnosti SlovakION	Centre of excellence	Vazovova 5, 812 43 Bratislava	oliver.moravcik@stuba.sk	http://www.stuba.sk/sk/vyskume/slovakion.html?page_id=8992
SK	SK01	Centrum excelentnosti pre návrh, prípravu a diagnostiku nanoštruktúr pre elektroniku a fotoniku 2 (NanoNet2)	Centre of excellence	Vazovova 5, 812 43 Bratislava	qputala@stuba.sk	http://www.nanonet.sk/2/
SK	SK03	Centrum excelentnosti výkonových elektronických systémov a materiálov pre ich komponenty	Centre of excellence	Univerzitná 8215/1, 010 26 Žilina	Branislav.Dobrucky@fel.uniza.sk	www.ceves.uniza.sk/
SK	SK01	Medzinárodné centrum excelentnosti pre výskum inteligentných a bezpečných informačno-komunikačných technológií a systémov	Centre of excellence	Vazovova 5, 812 43 Bratislava	viera.rozinajova@stuba.sk	http://sk.atos.net/sk-sk/home/Aktuality/novinky/Medzinarodnecentrumexcelentnosti.html

3.3 Competence centres

The competence centres are defined as development and research centres that are managed by partners from industrial sector and link partners from the industry and public research sector; they focus on the promotion of the development capability and the application of new technologies in manufacturing new competitive products, services and processes at priority areas of technological development. This function is complementary to that of the centres of excellence; together they constitute an autonomous whole in the area of research and development.

Five centres were selected within a public invitation to tender for the development of competence centres in 2010–2016:

1. Competence Centre for New Materials, Advanced Technologies and Energy - Kompetenčné centrum pre nové materiály, pokročilé technológie a energetiku (End date – 11/2015)

2. Building a Competence Centre for Research and Development in the Field of Molecular Medicine - Vybudovanie Kompetenčného centra pre výskum a vývoj v oblasti molekulárnej medicíny (End date – 11/2014)

3. Competence Centre for Intelligent Technologies for Computerization and Computerization of Systems and Services - Kompetenčné centrum inteligentných technológií pre elektronizáciu a informatizáciu systémov a služieb (End date – 12/2015)

4. Competence Centre for for Industrial Research and Development in Light Metal and Composites - Kompetenčné centrum pri priemyselný výskum a vývoj v oblasti ľahkých kovov a kompozitov (End date – 2014)

5. Competence Centre for Innovation in Production Systems in Industry and Services - Kompetenčné centrum znalostných technológií pre inovácie produkčných systémov v priemysle a službách (End date – 12/2014)

Table 4: Competence centres

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK01	Kompetenčné centrum pre nové materiály, pokročilé technológie a energetiku	Competence Centre	Vazovova 5, 812 43 Bratislava	marek.hanuska@savba.sk	http://www.elu.sav.sk/old/cekom/index.html
SK	SK01	Vybudovanie Kompetenčného centra pre výskum a vývoj v oblasti molekulárnej medicíny	Competence Centre	Šafárikovo námestie 6, P.O. BOX 540, 814 99 Bratislava 1	jan.turna@uvp.uniba.sk	https://uniba.sk/veda/vedecke-projekty-a-granty/kompetencne-centrum/
SK	SK01	Kompetenčné centrum inteligentných technológií pre elektronizáciu a informatizáciu systémov a služieb	Competence Centre	Vazovova 5, 812 43 Bratislava	milan.belko@stuba.sk	www.kompetencnecentrum.sk
SK	SK01	Kompetenčné centrum pri priemyselný výskum a vývoj v oblasti ľahkých kovov a kompozitov	Competence Centre	Račianska 75, P.O. BOX 95, 831 02 Bratislava	frantisek.simancik@savba.sk	http://www.inoval.sav.sk/file/subory/prezentacia_OPVaV.pdf
SK	SK04	Kompetenčné centrum znalostných technológií pre inovácie produkčných systémov v priemysle a službách	Competence Centre	Ul. 17 novembra č. 1, P.O. BOX 460, 081 16 Prešov	rektor@tuke.sk	http://www.unipo.sk/en/aktuality/17824/

3.4 Research centres

The research centres are institutions aimed at exploring, normally a specified area. Carry out basic and applied research, including using non-traditional techniques. They establish by many universities, with a view to implementing the specific research and educational activities. Most research centres demonstrates the scientific results of their work.

Five Research Centres in Slovakia:

1. Research Centre, University of Žilina - Výskumné centrum ŽU v Žiline

2. Centre of Applied Research of the New Materials and Transfer of Technologies - Centrum aplikovaného výskumu nových materiálov a transferu technológií (End date – 07/2015)

3. Research Center of Progressive Materials and Technologies for Current Applications „PROMATECH“ - Výskumné centrum progresívnych materiálov a technológií pre súčasné aplikácie „PROMATECH“

4. Research Centre ABT CPU in Nitra - Centrum výskumu AgroBioTech

5. BIOMED Martin - Martinské centrum pre biomedicínu

Table 5: Research centres

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK03	Výskumné centrum ŽU v Žiline	Research Centre	Univerzitná 8215/1, 010 08 Žilina	slavka.pitonakova@fhv.uniza.sk	http://www.vyskumnecentrum.sk
SK	SK01	Centrum aplikovaného výskumu nových materiálov a transferu technológií	Research Centre	Hviezdoslavovo nám. 18, 814 37 Bratislava	emilia.buciova@stuba.sk	http://www.vsvu.sk/vyskum-a-granty/granty-a-projekty/strukturalne-fondy/centrum-aplikovaneho-vyskumu-novych-materialov-a-transferu-technologii/
SK	SK04	Výskumné centrum progresívnych materiálov a technológií pre súčasné aplikácie „PROMATECH"	Research Centre	Letná 9, 042 00 Košice	jdusza@imr.saske.sk	http://konferencia.technicom.tuke.sk/presentations/2014/Dusza.pdf
SK	SK02	Centrum výskumu AgroBioTech	Research Centre	Akademická 2, 950 07 Nitra	agrobiotech@uniag.sk	http://www.agrobiotech.sk
SK	SK03	Martinské centrum pre biomedicínu	Research Centre	Kollárova 2, 036 01	nosalova@jfmed.uniba.sk	http://www.biomedmartin.sk

3.5 Technology parks

Technology parks are institutions that provide the concentration of knowledge, high technology, education and interaction with national and global institutions. They connect professionals and entrepreneurs who wish to realize their economic goals, which are based on new technologies. Similar to the business park whose primary objective is to business and production, technology parks, but the focus is on the development and scientific research activities. They set up mainly in the vicinity of higher education institutions and development centres and are attractive for top professionals, but also for young talents who want to improve and educate.

Technology Parks:

1. Science and Technology Park Žilna - Vedecko - Technologický Park Žilina

2. Centre for Information Technology Support (CePIT) - Centrum podpory informačných technológií (CePIT)

3. TTIP - Trnava Industrial Park

4. TECHNICOM - University Science Park for Innovative Applications with the Support of Knowledge Technologies, Technical University of Košice - Univerzitný vedecký park TECHNICOM pre inovačné aplikácie s podporou znalostných technológií, Technická univerzita v Košiciach

Table 6: Technology parks

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK03	Vedecko Technologický Park Žilina	Technology park	Univerzitná 25, 010 08 Žilina	kavecky@vtpzilina.sk	http://www.vtpzilina.sk/#novinky
SK	SK01	Centrum podpory informačných technológií (CePIT)	Technology park	Šafárikovo námestie 6, 814 99 Bratislava 1		https://uniba.sk/cepit
SK	SK02	TTIP Trnava Industrial Park	Technology park	Hlavná ulica 5, 917 01 Trnava	viera.vancova@trnava.sk	http://www.trnava.sk/sk/clanok/mestsky-priemyselny-a-technologicky-park-trnava
SK	SK04	Univerzitný vedecký park TECHNICOM pre inovačné aplikácie s podporou znalostných technológií	Technology park	Letná 9, 042 00 Košice	stanislav.kmet@tuke.sk	technicom.tuke.sk

3.6 Technology and Business incubators

The primary purpose of the incubators is to increase the potential for growth and survival of young firms by providing modular buildings, common technical infrastructure, managerial support and other support services. Business incubators are support organizations that assist in the creation, speeding up and long-term performance of the companies in that they provide space for the operation, advisory services, and opportunities for networking and collaboration with other companies.

Technology incubators:

1. University Technology Incubator of STU – InQb – Univerzitný technologický inkubátor STU Bratislava
2. Technology Incubator Centre Prešov – Technologické inkubátorové centrum Prešov
3. Technology Incubator Prievidza – Technologický inkúbátor Prievidza
4. Technology Incubator INOVATECH – Technologický inkubátor INOVATECH
5. Technology Incubator VTP Žilina - Technologický inkubátor VTP Žilina

Table 7: Technology incubators

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK01	UNIVERZITNÝ TECHNOLOGICKÝ INKUBÁTOR STU BRATISLAVA	Technology Incubator	Pionierska 15, 831 02 Bratislava	info@inqb.sk	www.inqb.sk
SK	SK04	TECHNOLOGICKÝ INKUBÁTOROVÉ CENTRUM PREŠOV	Technology Incubator	Reimanova 9, 080 01 Prešov	rpic@rpicpo.sk	www.rpicpo.sk
SK	SK02	TECHNOLOGICKÝ INKUBÁTOR PRIEVIDZA	Technology Incubator	Hviezdoslavova 5, 971 01 Prievidza	bicpd@bb.telecom.sk	http://www.prievidza.sk/podnikatel/technologicky-inkubator/
SK	SKO2	TECHNOLOGICKY INKUBÁTOR INOVATECH SLÁDKOVIČOVO	Technology Incubator	Fučíkova 460, 925 21 Sládkovičovo	inovatech@inovatech.sk	www.inovatech.sk
SK	SK03	TECHNOLOGICKÝ INKUBÁTOR VTP ŽILINA	Technology Incubator	Univerzitná 25, 010 08 Žilina	vtpzilina@vtpzilina.sk	www.vtpzilina.sk

Business incubators:

1. Business Incubator and Technology Centre Banská Bystrica – Podnikateľský inkubátor a technologické centrum Banská Bystrica
2. Incubator Bratislava – Inkubátor Bratislava
3. Business Incubator Gelnica – Podnikateľský inkubátor Gelnica
4. Business Incubator Handlová – Podnikateľský inkubátor Handlová

5. Incubator Malacky – Inkubátor Malacky
6. City Incubator Martin – Mestský inkubátor Martin
7. Business Incubator Moldava nad Bodvou – Podnikateľský inkubátor Moldava nad Bodvou
8. Business Incubator and Business Centre Rožnava – Podnikateľský inkubátor a Podnikateľské centrum Rožňava
9. Business Incubator Spišská Nová Ves I. and II. – Podnikateľský inkubátor Spišská Nová Ves I. a II.
10. Business Incubator and Business Centre Fiľakovo – Podnikateľský inkubátor a podnikateľské centrum Fiľakovo

Table 8: Business incubators

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK03	PODNIKATEĽSKÝ INKUBÁTOR A TECHNOLOGICKÉ CENTRUM BANSKÁ BYSTRICA	Business Incubator	Rudohorská 33, 974 11 Banská Bystrica 1	biatc@bicbb.sk	www.e-inkubator.sk
SK	SK01	INKUBÁTOR BRATISLAVA	Business Incubator	Škultétyho 1, 831 04 Bratislava 3	jozef.martinovic@tatrareal.sk	
SK	SK04	PODNIKATEĽSKÝ INKUBÁTOR GELNICA	Business Incubator	Hlavná 146, 056 01 Gelnica	inkubator.gelnica@gmail.com	www.gelnica.sk
SK	SK02	PODNIKATEĽSKÝ INKUBÁTOR HANDLOVÁ	Business Incubator	Nám. baníkov 5, 972 51 Handlová	sekretariat@inkubatorhandlova.sk	www.inkubatorhandlova.sk
SK	SK01	INKUBÁTOR MALACKY	Business Incubator	Bernolákova 1A, 901 01 Malacky	inkubator@inmalacky.sk	www.inmalacky.sk
SK	SK03	MESTSKÝ INKUBÁTOR MARTIN	Business Incubator	Šoltésovej 105/23 (prevádzka Flámska 1), 036 01 Martin 1	matra@matramartin.sk	
SK	SK04	PODNIKATEĽSKÝ INKUBÁTOR MOLDAVA NAD BODVOU	Business Incubator	Školská 10, 045 01 Moldava nad Bodvou	inkubator@moldava.sk	www.moldava.sk
SK	SK04	PODNIKATEĽSKÝ INKUBÁTOR ROŽŇAVA	Business Incubator	Zakarpatská 19, 048 01 Rožňava 1	inkubator@rpicrv.sk	www.rpicrv.sk
SK	SK04	PODNIKATEĽSKÝ INKUBÁTOR SPIŠSKÁ NOVÁ VES I. a II.	Business Incubator	Zimná 72 (prevádzka Tehelná 20), 052 01 Spišská Nová Ves 1	inkubatorsnv@stonline.sk	www.inkubatorsnv.szm.com
SK	SK03	PODNIKATEĽSKÝ INKUBÁTOR A PODNIKATEĽSKÉ CENTRUM	Business Incubator	Biskupická 4, 986 01 Fiľakovo	tectum@tectum.eu.sk	www.tectum.eu.sk

3.7 Other Smart Factory relevant organisations in Slovakia

Table 9: R&D support institutions

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK01	Agentúra na podporu výskumu a vývoja	R&D support institution	Mýtna 23, 839 04 Bratislava 32	agentura@apvv.sk	http://www.apvv.sk
SK	SK01	SIEA Slovenská inovačná a energetická agentúra	R&D support institution	Bajkalská 27, 827 99 Bratislava	office@siea.gov.sk	https://www.siea.sk

Table 10: Business support organisations

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK01	Slovenská agentúra pre rozvoj investícií a obchodu (SARIO)	Business support organisation	Trnavská cesta 100, 821 01 Bratislava	sario@sario.sk	http://www.sario.sk/sk
SK	SK01	Slovak Business Agency	Business support organisation	Karadžičova 2, 811 09 Bratislava 2	agency@sbagency.sk	http://www.sbagency.sk

Table 11: Ministries and governmental bodies

Country	NUTS2	Name	Institution Type	Adress	E.mail	Webpage
SK	SK01	Výskumná agentúra	Ministry/Government	Hanulova 5/B, 841 01 Bratislava	info@vyskumnaagentura.sk	http://www.vyskumnaagentura.sk
SK	SK01	Splnomocnenec vlády SR pre výskum a inovácie	Ministry/Government	Bratislava	jaromir.pastorek@vlada.gov.sk	

4 Smart Factory support schemes and programmes

This chapter describes financial environment, support schemes and programmes including relevant policies in Republic of Slovakia. Furthermore identified currently available or future programmes, grants, loans specifically relevant for SFH project are presented.

4.1 Funding of research and innovations

From the point of view of expenditures on research and innovations Slovakia permanently provides insufficient resources in this area. One of the reasons has been the selected form of privatisation of large companies when research and innovation departments have been separated and privatised which has led to their separation from practice. In the previous decade, the total expenditures for research and development were roughly 0.5 % of GDP, growing to 0.6% in recent years (in 2011 it was 0.68%). This growth has been made by growth of capital expenditures for appliances and equipment, which can be caused by the use of the structural funds in research and development. In the 2010-2011, the resources for salaries were increased significantly. When comparing the total expenditures for research and innovations in other European economies (2.03% of GDP in 2011), Slovakia belongs to the countries with the lowest expenditures. An important part of public sources in research and innovations covers expenditures of basic research without connection to economic performance of the country.

The share of business expenditures in research and innovations is roughly 0.25% of GDP (2% of GDP in developed economies). In Finland this figure in 2011 was 2.67%, in Sweden 2.34%, in the Czech Republic 1.11% and in Hungary 0.75% (Eurostat, 2013). The reason of this reality is that the present multinational companies carry out research and innovation activities mostly in their home countries. However, the Slovak companies and medium enterprises intensively develop their research and innovation and intend to build research and innovation centres in Slovakia.

If we look at the structure of expenditure in research and development (in terms of resources), we can observe two main trends: the dominance of the public sector (in 2011 the Slovak public sector funded R&D expenditure of the amount of 0.34% of GDP) and increasing share of foreign sources; while there is the significant impact of EU structural funds, which in 2011 accounted for 60% of all foreign sources of R&D expenditure flowing to Slovakia. The following parameters in terms of SII development can be considered as critical:

- inappropriate structure of PhD graduates (insufficient share of technical and scientific fields,
- low number of excellent research teams,
- low amount of total R&D expenditure and orientation of the R&D ,
- insufficient innovation activity of SMEs,
- insufficient cooperation among innovation stakeholders (especially as regards companies; R&D
- departments),

- low representation of knowledge-intensive activities in the economy,
- low patent activity.

4.2 Tools of funding of research and development

Tools to support research and development under the existing legislation are as follows:

National programmes are conducted pursuant to the Act 172/2005. Ten national research and development programs in accordance with the priorities of the state science and technology policy were approved by the Government. This instrument pursuant to the Act has been in force since 1 July 2005.

Agency to support research and development (hereinafter referred to as "APVV") supports research and development programmes in accordance with Act 172/2005. Agency programmes are approved by the Government after consultation of the Government Council for Science, Technology and Innovation. By 31 December 2012, APVV through a grant scheme supported 22 projects in the amount of EUR 1,023 thousand. The APVV will be transformed to become a more effective institution, coordinating its activities with ASFEU. In the 2014-2020 period there are planned expenditure on operations and programmes of APVV in total sum of EUR 316 million. This tool will be now tripled which assumes more effective activity.

Incentives for research and development are provided to entrepreneurs in accordance with the Act 185/2009 on incentives for research and development as amended to deal with R&D projects with the aim to base their development and business plans on the results of research, development and innovation, to extend the staff capacity of R&D, as well as to increase investment in research and development. Totally, 16 subjects were supported with the amount of EUR 7,500 thousand. In the 2014-2020 period, expenditures on R&D incentives in total amount of EUR 108 million are planned. It is an essential tool for promoting business sector. That sum should be doubled by 2020.

Grants to legal persons and natural persons are provided in accordance with the Act 172/2005 on the organization of state support for research and development by the central state administration bodies. This tool was introduced on 1 July 2005. In the 2014-2020 period, the budget for R&D is planned at the sum of EUR 115 million.

Grants for scientific and technical services are provided in accordance with the Act 172/2000 on the organization of state support for research and development. Grants may be provided from the state budget for activities of legal persons and natural persons - entrepreneurs to support research and development. Providers may be central state administration bodies or the Slovak Academy of Sciences. The grant is state aid. In the 2014-2020 period, the budget for scientific and technical services is planned in total sum of EUR 73 million.

4.3 Operational Programme Research and Development

Operational Programme Research and Development plays the role in modernising the system of support for research and development and improvement of infrastructure in order to increase the competitiveness of the economy, reduce regional disparities, create new innovative (high-tech) SMEs, promote creation of the new jobs and improve the conditions of the educational process at universities. By 31 May 2013, more than EUR 1,118 thousand were contracted, which is 81.91% of the total allocation. The total number of projects is 485. Effectiveness can be increased by introduction of rules on coordination and communication between the management authority and the implementing agency ASFEU and communication with APVV. The following weaknesses have been identified in the process of implementation:

- Insufficient connection to state policies of research and development and relative separation of the Operational Programme Research and Development;
- Missing strategy of implementation for the entire programming period related to the objectives of the Operational Programme Research and Development;
- Low rate of complementarity and synergies in the process of implementation of the Operational Programme Research and Development and activities and initiatives of the European research space;
- Excessive administrative burden imposed on the applicants for a grant;
- Inappropriate set of indicators;
- Existing barriers between individual projects, especially ban on the use of infrastructure built in one projects in other activities of the applicant, including the use in international projects;
- Inappropriate rules of state aid which do not allow to use the infrastructure built from public resources to meet the needs of industry and practice. The same applies on the rules of the use of this infrastructure by public operators for payment

Positive effects of projects funded by the Operational Programme Research and Development:

- building a basic public infrastructure and reduction of long-term lagging
- increasing potential for involvement of international projects of research and development
- starting the process of identification of strong thematic orientations of the Slovak science required by the industry
- definition of priorities and linking the scientific teams allowed the universities and the Slovak Academy of Sciences to start building the science parks and research centres of national importance

4.4 Operational Programme Education

Operational Programme Education plays the role of ensuring long-term competitiveness of Slovakia by adapting the education system to the needs of the knowledge society. Through the grants from the European Social Fund it supports the formation and promotion of human capital in the acquisition of basic skills and key competencies needed in the knowledge economy and

the labour market. Demand-oriented projects carried out by ASFEU do not exceed EUR 2 million. By 31 May 2013 there was contracted EUR 565 345 874.13, which is 101.60% in relation to the total allocation. The total number of projects is 832.

- Insufficient support of professional education, natural sciences, practical skills (changes appeared in 2012 which is not sufficient, taking into account the needs to comply the education with the needs of practice).
- The life-time education area and education of persons with specific needs (due to various handicaps) were supported insufficiently.

4.5 Operational Programme Competitiveness and Economic Growth

Basis of the Operational Programme Competitiveness and Economic Growth, the Managing Authority of which was the Ministry of Economy, was a priority axis 1 "Innovation and growth of competitiveness" in the framework of which 456 projects were supported with a total contract less than EUR 395 million. The projects resulted in the increase of innovations of technologies and products in enterprises and services, prototypes and tests, innovations of management systems. Almost 2,000 new jobs were created. As the projects continue, 2,000 further jobs are expected in the future.

In the framework of the measure "Innovation and technology transfers", which was oriented to innovation and technology transfer, 403 projects were supported, including 376 projects of small and medium-sized enterprises. These enterprises were particularly interested in the purchase and restoration of technology park. The measure is very popular and used by businesses, but sources were not used only for the purchase of high-tech technologies. This situation is mainly due to the current status of technology companies in Slovakia and that is why the measure is evaluated as positive.

Within the measure "Support of innovation activities in enterprises" 42 projects of research and development were supported, of which 37 in the area of small and medium-sized enterprises and 4 projects in large companies.

From the funds allocated in the Operational Programme Competitiveness and Economic Growth also so called "Common services to businesses" were supported to promote public sector in building infrastructure for business development in industry and services sector, in particular micro-, small- and medium-sized enterprises (SMEs). In total, 11 projects were supported, which should lead to creation of more than 3,200 new jobs, especially in industrial parks in Slovakia. The main drawback was the lack of action synergy and complementarity with other Operational Programmes, stemming for example from the unfinished road infrastructure.

From the sources of the Operational Programme Competitiveness and Economic Growth a JEREMIE project was supported to improve the financing of business activities. The sum of EUR

60 million was allocated. To this date, however, JEREMIE was not launched practically (more information below).

The targets and objectives of the Operational Programme Competitiveness and Economic Growth are being achieved. Within the implementation the following weaknesses have been identified:

- complicated management process under the JEREMIE initiative because of a lack of coordination (Ministry of Finance, Ministry of Economy, EIF, managing authorities of particular operational programmes),
- complicated bureaucracy - the administrative burden both for donor and recipient,
- exclusive orientation to SMEs without the use of the potential of large companies
- inadequate funding system (reimbursement of eligible costs)
- inappropriately (ambiguous) set procurement system,
- system of the evaluation of the programme is focused more on the quantitative side than on quality assessment.

Despite these weaknesses, the Operational Programme Competitiveness and Economic Growth in promoting growth, competitiveness and job creation succeeds in meeting those parameters which are not measured at the programme level, but are pursued at the measure level in line with the objectives of Europe 2020.

At the same time the Operational Programme Competitiveness and Economic Growth is the producer of jobs for disadvantaged groups – the young unemployed up to 29 years of age.

On the basis of currently accepted applications it is possible to expect that roughly 1,600 new jobs will be created in the promotion of innovation and technology, dedicated to this disadvantaged population group and in the support of tourism service provision 320 new jobs should be created, occupied by young people under 29 years of age.

The support of projects focused on innovation and competitiveness growth also brings increased value added or sales growth of the supported businesses, and increase of private investment. In these areas it is possible to see the physical progress, as the enterprises so far have invested more than EUR 188 million from its own resources, or their value added on average grew by almost 70%, and sales grew by more than 110%.

In the Operational Programme Competitiveness and Economic Growth 83 new projects were supported throughout Slovakia.

A summary of relevant support schemes, measures and calls including information about implementation body, available budget, eligible costs and other relevant data is presented in Table 12.

Table 12: National support schemes summary

Country	Measure/Call	Implementation body	Priority Axis	Estimated costs in EUR			Year from	Year to
				EU	State budget	Own		
SK	Intersectoral cooperation	Slovak Innovative and Energy Agency	1. Support of research, development and innovation 2. Support of research, development and innovation in Bratislava region	17.760.000	6.140.000	0	2016	2023
SK	Increasing innovation performance of the Slovak economy	Slovak Innovative and Energy Agency	1. Support of research, development and innovation 2. Support of research, development and innovation in Bratislava region	27.250.000	9.750.000	0	2016	2023
SK	Increase use of protection Intellectual property rights	Slovak Innovative and Energy Agency	1. Support of research, development and innovation 2. Support of research, development and innovation in Bratislava region	21.625.000	5.875.000	0	2016	2023
SK	Monitoring business environment in line with the application of the principle "Think Small First".	Slovak Business Agency	3. Strengthening the competitiveness and growth of SMEs	6.998.529	1.235.035	0	2016	2023
SK	National project NPC* II – BA county	Slovak Business Agency	4. Development of competitive SMEs in the BA region	112.866.555	12.866.555	0	2016	2023
SK	Supporting the internationalization of SMEs	Slovak Investment and Trade Development Agency	3. Strengthening the competitiveness and growth of SMEs	31.000.000	4.625.000	25K	2016	2023
SK	National NPC project in the regions	Slovak Business Agency	3. Strengthening the competitiveness and growth of SMEs	38.070.000	6.718.234	0	2017	2023

***** NPC – Národné podnikateľské centrum **-** National Business Center

5 Trends in the manufacturing sector

Relevant manufacturing trends based on EUROSTAT[4] statistical data are presented in this chapter.

Indicator presented on Figure 3 covers the number of enterprises active during at least part of the reference period. The data is broken down by size classes of persons employed.

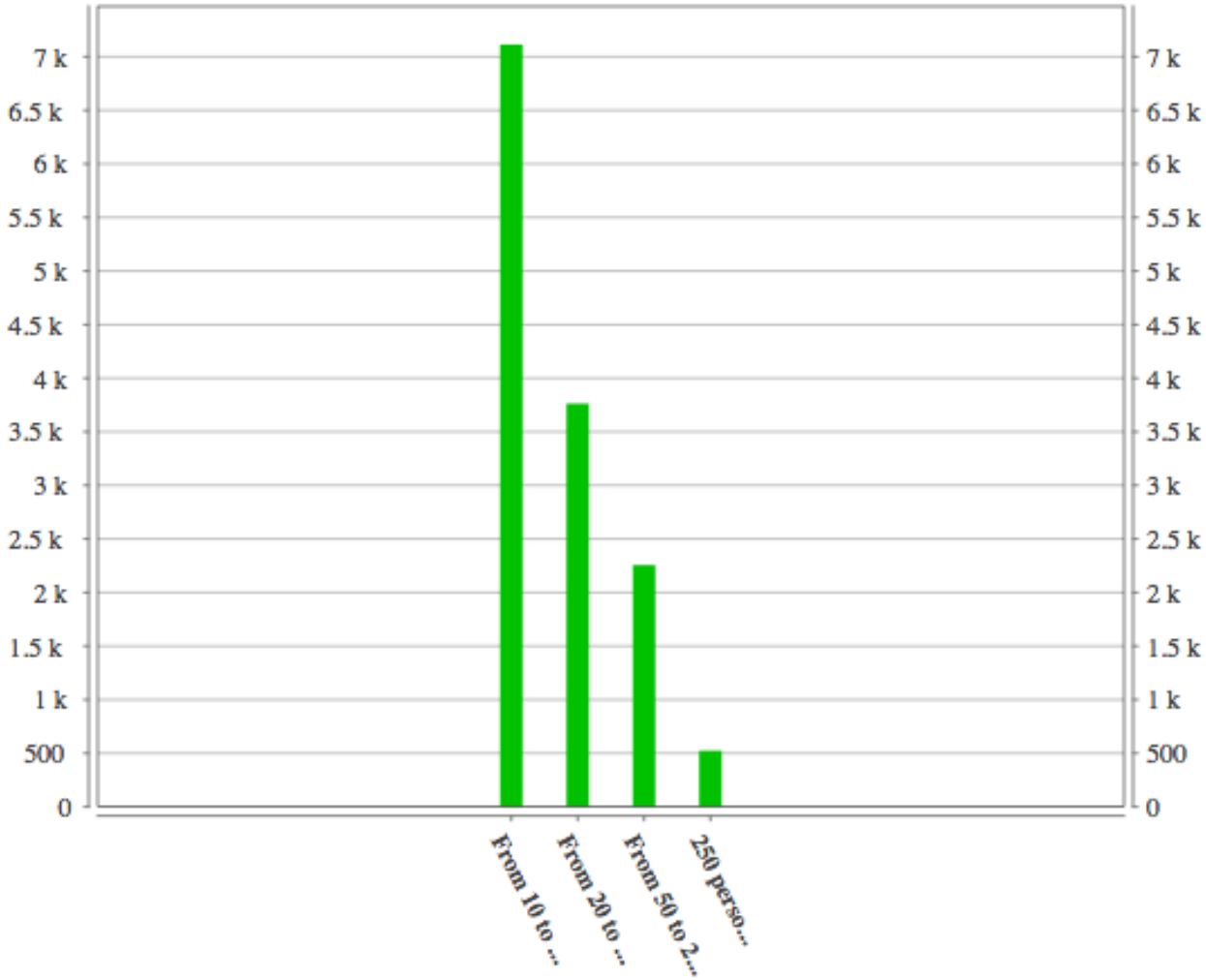

Figure 3: Slovakia - Number of enterprises in the non-financial business economy by size class of employment

[4] http://ec.europa.eu/eurostat/guip/themeAction.do

Turnover is the total of all sales (excluding VAT) of goods and services carried out by the enterprises of a given sector during the reference period and is presented on Figure 4. The data is broken down by size classes of persons employed.

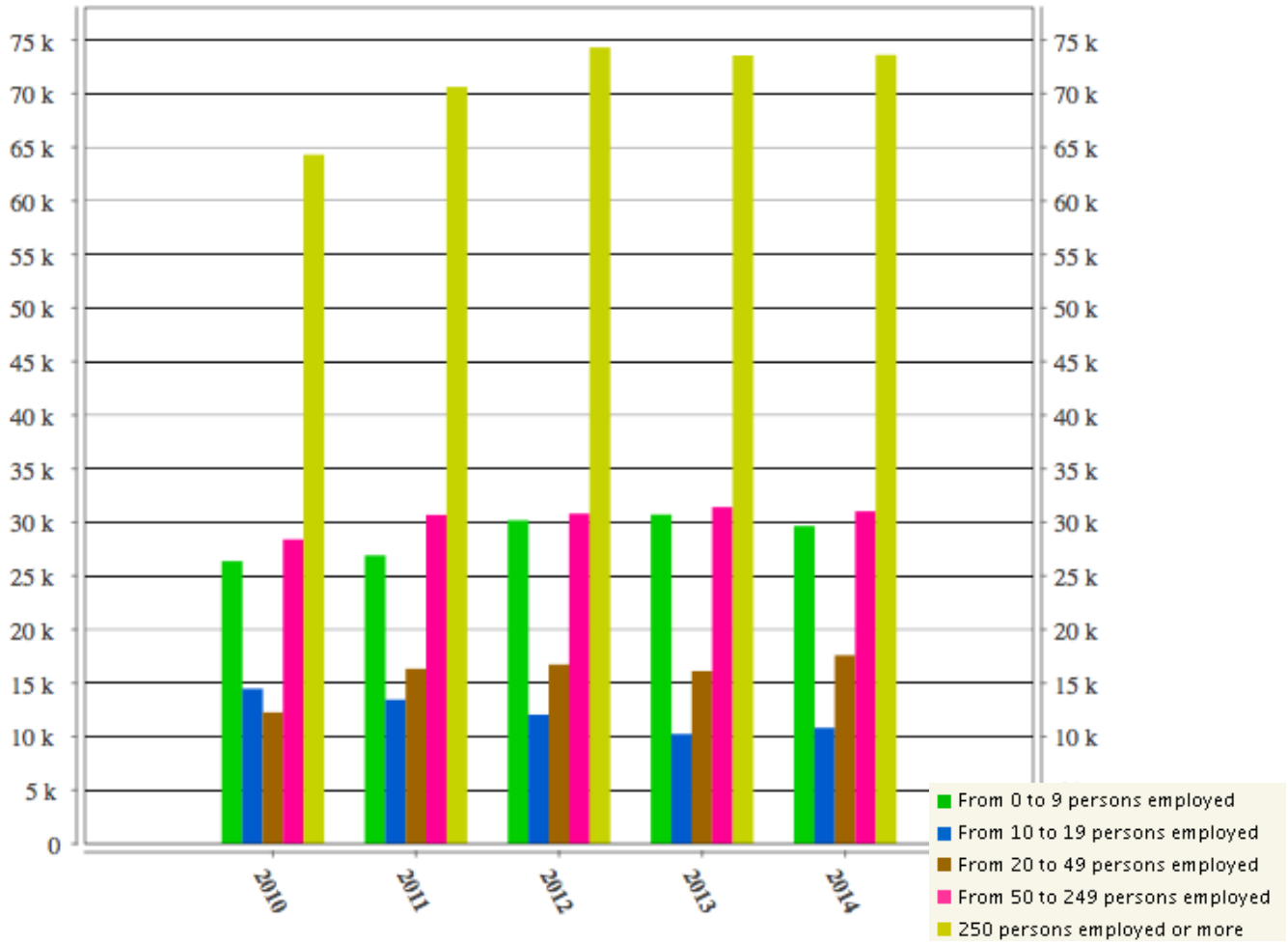

Figure 4: Slovakia - Turnover of the non-financial business economy by size class of employment - Millions EUR

The Turnover Index presented on Figure 5 is a business cycle indicator showing the monthly evolution of the market of goods and services in the industrial sector. It also records the evolution of turnover over longer periods of time. The turnover of industry index is not deflated. It is therefore the objective of this indicator to measure the market activity in the industrial sector in value.

Data are compiled according to the Statistical classification of economic activities in the European Community, (NACE Rev. 2, Eurostat). Industrial turnover is compiled as a "fixed base year Laspeyres type volume-index". The current base year is 2010 (Index 2010 = 100). The index is presented in calendar and seasonally adjusted form. Growth rates with respect to the previous month (M/M-1) are calculated from calendar and seasonally adjusted figures while growth rates with respect to the same month of the previous year (M/M-12) are calculated from calendar adjusted figures.

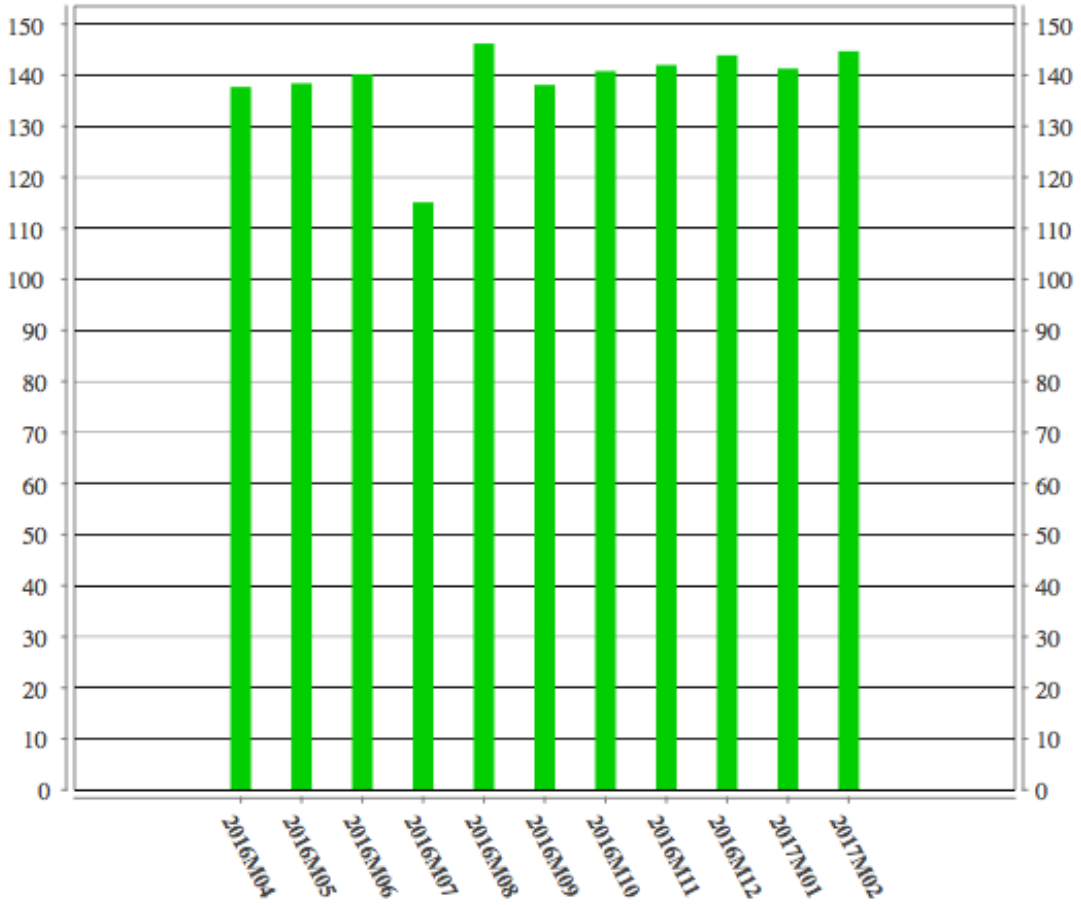

Figure 5: Slovakia - Turnover in industry - manufacturing

The industrial production index presented on Figure 6 shows the output and activity of the industry sector. It measures changes in the volume of output on a monthly basis. Data are compiled according to the Statistical classification of economic activities in the European Community, (NACE Rev. 2, Eurostat). Industrial production is compiled as a "fixed base year Laspeyres type volume-index". The current base year is 2010 (Index 2010 = 100). The index is presented in calendar and seasonally adjusted form. Growth rates with respect to the previous month (M/M-1) are calculated from calendar and seasonally adjusted figures while growth rates with respect to the same month of the previous year (M/M-12) are calculated from calendar adjusted figures.

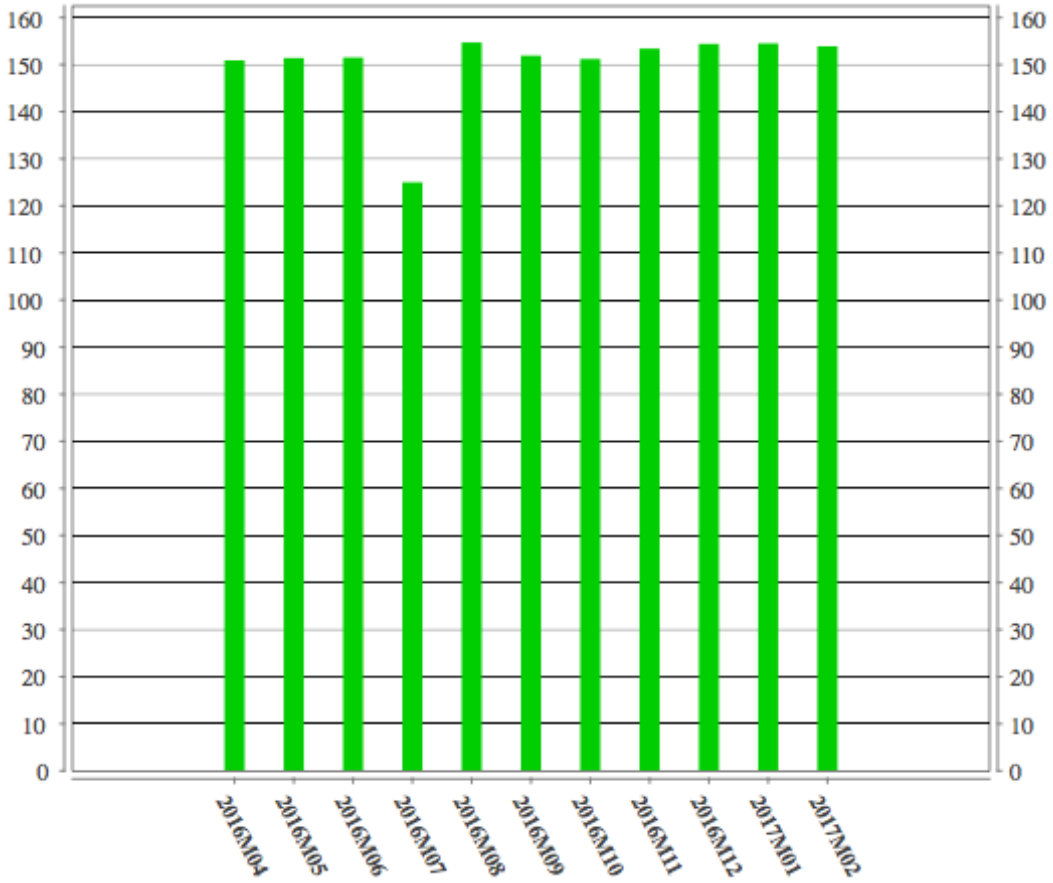

Figure 6: Slovakia - Production in industry - manufacturing

6 Smart Factory related projects

This chapter presents relevant national projects in execution by the partner or partnering organisations.

Table 13: Smart Factory related projects - extract

Main applicant country	Project name	Programme name	Year from:	Year to:
SK	EcoInn Danube	Interreg Danube Transnational Program	2016	2019
SI	I-CON	Interreg Danube Transnational Program	2016	2019
SI	Smart Factory HUB	Interreg Danube Transnational Program	2016	2019
EU	Business and Innovation Support Services (BISS Slovakia) - Enterprise Europe Network	EK – BIC	2017	2018
SK	Inovujme.sk	Európsky fond regionálneho rozvoja, Operačný program výskum a inovácie	2017	2023
DE	Made in Danube	Interreg Danube Transnational Program	2017	2019
RO	D-STIR	Interreg Danube Transnational Program	2017	2019
AT	ResInfra@DR	Interreg Danube Transnational Program	2017	2019
SI	InnoHPC	Interreg Danube Transnational Program	2017	2019

7 List of regional actors

This chapter presents Smart Factory relevant actors identified by SCCI.

Production oriented SMEs as potential users of solutions are presented in Table 14.

Table 14: List of regional actors – users

NUTS2	Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
SK02	SLOVENSKÉ CUKROVARY, s.r.o.	SME	Food Manufacturing	Manufacturing		Cukrovarská 726, SK-926 01 Sereď	www.agrana.sk
SK02	Stimba s.r.o.	SME	Machinery manufacturing	Manufacturing		Súvoz 1/1662, 911 01 Trenčín	www.stimba.sk / www.bost.sk
SK03	CRT-ELECTRONIC, s.r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing		1080 Oravská Lesná 029 57	www.crt.sk
SK02	MOTOSAM a.s.	SME	Primary metal manufacturing	Manufacturing		Kpt. M. Uhra 57/3, 907 01 Myjava	www.motosam.sk
SK02	Euro BREW s.r.o.	SME	Beverage and tobacco product manufacturing	Manufacturing		Hlboká 22, 917 01 Trnava	www.eurobrew.sk
SK04	MEDIST s.r.o.,	SME	Medical equipment and supplies manufacturing	Manufacturing		Petrušovského 4, 06601 Humenné	www.medist.sk
SK01	McCarter a.s	SME	Food Manufacturing	Manufacturing		Bajkalská 25, 821 01 Bratislava	www.mccarter.sk
SK04	mkem, spol. s r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing		Továrenská 15, 06401 Stará Ľubovňa	www.mkem.sk
SK04	ProTech Service s.r.o.	SME	Primary metal manufacturing	Manufacturing		Ku Surdoku 35, 080 01 Prešov	www.commercservice.sk
SK04	PLOSKON AT, s.r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing		Jesenná 1, 080 01 Prešov	www.ploskon.sk
SK03	Neuman Aluminium Fliesspresswerk Slovakia s.r.o	SME	Primary metal manufacturing	Manufacturing		Partizánska 85, SK-96681 Zarnovica	www.neuman.at
SK02	JAMP s.r.o	SME	Fabricated metal product manufacturing	Manufacturing		Pivovarská 458, 019 01 Ilava	www.jamp.sk/uvod/
SK02	Rübig sk k.s.	SME	Primary metal manufacturing	Manufacturing		Priemyselný park Prievidza Západ, Západná ulica 50, 97101 Prievidza	www.rubig.com/sk/
SK03	Gastroservis s.r.o.	SME	Fabricated metal product manufacturing	Manufacturing		Námestie Vajanského 12, 974 00 Banská Bystrica	www.gastroservis.sk
SK02	AMI s.r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing		Komárňanská cesta 13, 94043 Nové Zámky	www.ami.sk

NUTS2	Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
SK03	VOR s.r.o.	SME	Machinery manufacturing	Manufacturing		Fándlyho 36, 010 01 Žilina	www.vor.sk
SK01	IDO Hutný projekt a.s.	SME	Other	Engineering		Tomášikova 64, 83104 Bratislava	www.hupro.sk
SK01	Výskumný ústav papiera a celulózy a. s., Bratislava	SME	Paper manufacturing	Manufacturing	R&D	Dúbravská cesta 14, 84104 Bratislava 4	www.vupc.sk
SK03	ŽIAROMAT a.s.	SME	Other	Manufacturing		Továrenská 1, 985 01 Kalinovo	www.ziaromat.sk
SK02	ESM YZAMER, energetické služby a monitoring s.r.o.	SME	Other	Manufacturing		Skladová 2, 917 01 Trnava	www.yzamer.sk
SK03	Avex electronics s. r. o.	SME	Computer and electronic product manufacturing	Manufacturing	R&D	Fľajšová 957, 029 57 Oravská Lesná	www.avex.sk
SK04	Minerálne vody a.s. Prešov	SME	Food Manufacturing	Manufacturing		Slovenská 9, 081 86 Prešov	www.minvody.sk
SK03	EIBEN s.r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing	Engineering	Na Hôrke 3, 960 01 Zvolen	http://eiben.sk
SK04	2J s.r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing		Štefánikova 61, 085 01 Bardejov	www.2j-antennae.com
SK04	Elcom, s.r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing		Jesenná 2695/26, 080 01 Prešov	www.elcom.eu
SK03	ORIK s.r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing		Oravická 613, 028 01 Trstená	www.orik.sk
SK03	GeLiMa a.s.	SME	Food Manufacturing	Manufacturing		Priemyselná 1, 031 39 Liptovský Mikuláš	www.weishardt.com/sk/

Identified potential solution providers for Smart Factories are presented in **Table 15**.

Table 15: List of regional actors - solution providers

NUTS2	Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
SK01	SOVA Digital a.s.	SME	Innovation solution provider	Engineering	Consulting	Bojnická 3, 831 04 Bratislava, Slovakia	http://www.sova.sk
SK03	CEIT a.s.	SME	Innovation solution provider, Industry engineering	R&D	Consulting	Univerzitná 8661/6A, 010 08 Žilina, Slovakia	http://www.ceitgroup.eu
SK02	Sitris s.r.o.	SME	Industry ngineering, Technology solution provider	Engineering		Kukorelliho 11, 901 01 Malacky, Slovakia	http://www.sitris.sk
SK03	GAMO a.s.	SME	Information technology, Cloud computing	Services		Kyjevské námestie 6, 974 04 Banská Bystrica, Slovakia	www.gamo.sk

NUTS2	Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
SK01	Institute of Robotics and Cybernetics, Faculty of Electrical Engineering and Information Technology Slovak University of Technology in Bratislava	R&D	Electronic and robotic engineering	Research and dev.	Education	Ilkovičova 3, 812 19 Bratislava, Slovak Republic	www.urpi.fei.stuba.sk
SK01	National Centre of Robotics	R&D	Electronic and robotic engineering	Research and dev.		Ilkovičova 3, 841 04 Bratislava	http://nacero.sk
SK03	Research Centre University of Žilina	R&D	New materials, construction, mechanical and smart systems engeineering	Research and dev.	Education	Univerzitná 8215/1, 010 26 Žilina, Slovakia	http://vyskumnecentrum.sk
SK03	robotec, s. r. o.	SME	Industry automation, Robotic engineering	Engineering	Research and dev.	Hlavná 3, 038 52 Sučany, Slovak republic	http://robotec.sk
SK01	Research Centre ESET (ESET, spol. s r.o.)	SME/R&D	Information technology, Cybersecurity	Research and dev.		Einsteinova 24, 851 01 Bratislava, Slovenská republika	https://www.eset.com/sk/o-nas/vyskumne-centrum/
SK02	Electrotechnical research and projecting company, EVPÚ a.s.	SME	Electrical and electronic engineering industries	Engineering	Research and dev.	Trenčianska 19, 018 51 Nová Dubnica, Slovakia	http://evpu.sk
SK04	MARTO s.r.o.	SME	Mechanical and robotic engineering	Engineering		Letecká 37, 052 01 Spišská Nová Ves, Slovakia	http://www.marto.sk
SK03	IPA Slovakia, s.r.o.	SME	Provider of solutions and methods of production processes	Consulting	Education	Predmestská 8600/95, 010 01 Žilina, Slovakia	http://www.ipaslovakia.sk

A number of companies presented in **Table 16** was identified for acting as potential user and also solution provider for Smart Factories.

Table 16: List of regional actors - Users/solution providers

NUTS2	Name	Institution type	Industry sector	Service type 1	Service type 2	Adress	Webpage links
SK01	IDO Hutný projekt a.s.	SME	Other	Engineering		Tomášikova 64, 83104 Bratislava	www.hupro.sk
SK01	Výskumný ústav papiera a celulózy a. s., Bratislava	SME	Paper manufacturing	Manufacturing	R&D	Dúbravská cesta 14, 84104 Bratislava 4	www.vupc.sk
SK03	Avex electronics s. r. o.	SME	Computer and electronic product manufacturing	Manufacturing	R&D	Fľajšová 957, 029 57 Oravská Lesná	www.avex.sk
SK02	AMI s.r.o.	SME	Electrical equipment, appliance & component manufacturing	Manufacturing		Komárňanská cesta 13, 94043 Nové Zámky	www.ami.sk

8 List of annexes

Microsoft Excel file “D3.2.1_Regional mapping Slovakia_SFH_SCCI.xlsx”

Main applicant country	Project name	Programme name	Year from:	Year to:	Short description
SK	EcoInn Danube	Interreg Danube Transnational Program	2016	2019	General objective of the EcoInn Danube project is to enhance c innovation actors in the field of ecoinnovations with special emp development and application of ecotechnologies in the Danube The project will focus mainly on field of renewable energy and e (efficiency).
SI	I-CON	Interreg Central Europe	2016	2019	Main problem is related to innovation capacity in remote areas. SK those areas are facing declining employment opportunities i industries as a result of structural change.This emphasizes the steps to stimulate economic activity with employment generatin regions are facing difficulties in maintaining a critical mass of fa economic development.Analysis show that FOOD SECTOR tog value chain related sectors represent one of the most important to leverage improvement of socio-economic situation in remote OBJECTIVE:Improving entrepreneurial competences and skills through FOOD innovation potentials. OUTPUTS:1) Joint transn mentor scheme;2) Food crowd design platform usability. APPR consists of 10 carefully selected competent partners who are ac role in the project divided into 3 groups. KNOWLEDGE PARTN areas of mechatronics, food safety and packing design; REGIO PARTNERS whose role is implementation of actions on a regio LEAD PARTNER who's role is related to be engaged in all mair intervention together with WP coordinators. INNOVATIVE CHA MENTOR SCHEME: integrated cross-sectoral experts approac (mechatronics,biotech & design), mobility of transnational pool coming from different EU regions,focus oriented program to foo SMEs,sustainable business model; no similar scheme existing. DESIGN PLATFORM USABILITY: unlocking food legislation re