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REPUBLIC OF SLOVENIA
GOVERNMENT OFFICE FOR DEVELOPMENT AND EUROPEAN COHESION POLICY

TECOS

ACTION PLAN

SMARTY INTERREG PROJECT

APRIL 20, 2022

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INTRODUCTION

Partners from regions across Europe have joined forces to exchange best practices on how policies related to Structural Funds can unlock Industry 4.0 to its full potential for their business ecosystems.

The SMARTY project has established a common basis of policy learning among its members to overcome Industry 4.0 adoption barriers through a variety of novel approaches, such as financing mechanisms, innovation hub services, digitalisation road mapping and supply-demand brokerage.

These best practices have been analysed through a project methodology that has graded such approaches based on their measurable impact in their host regions and their potential of transferability and relevance for adoption in other SMARTY regions.

GENERAL INFORMATION & APPROVAL

Produced by each region, the action plan is a document providing details on how the lessons learnt from the cooperation will be exploited in order to improve the policy instrument tackled within that region. It specifies the nature of the actions to be implemented, their timeframe, the players involved, the costs (if any) and funding sources (if any). If the same policy instrument is addressed by several partners, only one action plan is required.

Project Name	SMARTY Interreg Programme
Partner Organisation	TECOS, Slovenian tool and die development centre
Other Partner Organisations Involved	Government of Republic of Slovenia, Government office for development and cohesion policy
Country	Slovenia
NUTS 2 Region	EASTERN AND WESTERN SLOVENIA
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Policy Context	This Action Plan aims to impact other regional development policy instruments.
Name of Policy Instrument Addressed	Slovenian strategy for smart and sustainable specialization – S5 Operational program 2021-2028

POLICY CONTEXT[1]

BASIC INFORMATION AND BACKGROUND

Slovenia has become independent in 1991, and has become a full member of EU in 2004. It covers an area a little over 21.000 km^2, has slightly over 2,1 million inhabitants, and is combined of two NUTS2 regions (Cohesion regions - Eastern and Western Slovenia) as well as 13 Statistical regions[2].However Slovenia does not have a decentralized planning system when it comes to development of strategies and Operational programmes. Whereas statistical regions do prepare their regional development plans, the same do not have management authority over their implementation. All the RDPS are incorporated and adjusted to the national strategies and programmes and integrated. The management of all policies lies within the Government of Slovenia and its relevant ministries and offices. Slovenia has not introduced 2.tier of government – regional level. The discussions on this have been on-going for more than 30 years. However, no political agreement on introducing it have been reached yet.

ECONOMIC CONDITIONS IN SLOVENIA

Productivity

In Slovenia, the average annual growth of labor productivity (measured by GDP per employee) slowed down in recent years after economic recession in comparison to EU-27. This was of course disrupted due to COVID-19 pandemic which resulted in the first initial sharp decline. The employment however remained relatively high due to government support measures all resulting in a sharp decline in the labor productivity indicator, measured by GDP per employee, which in 2021 again exceeded pre-epidemic levels. Slowdown of productivity growth resulted in slower catch up with more developed countries, which resulted in 89% of the EU average in GDP per capita in purchasing power.

The analysis made by Institute of macroeconomic analysis and development and its productivity report[3] shows that the key to slower catching up to EU average is the lower level of productivity, as the employment rate in Slovenia was higher than the EU average in the entire observed period.

Productivity increased relatively quickly in manufacturing, due to more intensive applications of robotics, industry 4.0 transformation and high exposure to international competition, as the manufacturing companies are especially embedded in international

[1] For the purpose of the SMARTY project and given the particular geographical and political context we consider the whole Slovenia (NUTS1) and both NUTS2 regions.
[2] https://en.wikipedia.org/wiki/Statistical_regions_of_Slovenia
[3] https://www.umar.gov.si/en/publications/productivity-report2/

value chains. The analysis of Slovenian companies and their productivity shows, that companies with high profitability are better for their growth, employees and environment. Among the 5% fastest growing companies in terms of productivity in the period 2014-2019, 99% are from the SME[4] group, of which 43% are micro, 49% small and 7% medium-sized, while smaller companies also achieve higher productivity growth.

Companies with higher productivity operate in all types of activities, indicating that factors at the level of companies (rather than sectors) play a key role. It is worth noting that the share of companies in high-tech activities at 9%, seems relatively low. The products of the most productive and fastest growing companies are mainly in niche segments, both for B2B as well as B2C customers.

If considering fastest growing large companies, the majority is active in manufacturing, they are both domestically and foreign owned and focused on end products.

Manufacturing sector

The largest industrial branches in Slovenia are:

- Wood and wooden products (without furniture)
- Chemicals
- Pharmaceuticals,
- Plastic products
- Metals,
- Machinery
- ICT production
- Automotive and mobility industries.

Some of the main indicators with the focus on the size of the companies is displayed below:

[4] Statistical data shows, that over 98% of the companies in Slovenia are micro, small and medium size enterprises.

	Number of companies				Persons employed				Revenue (1000 EUR)			
	Micro (0-9)	Small (10-49)	Medium (50-249)	Large (250+)	Micro (0-9)	Small (10-49)	Medium (50-249)	Large (250+)	Micro (0-9)	Small (10-49)	Medium (50-249)	Large (250+)
MANUFACTURING	17.694	1.785	514	124	33.204	36.445	55.818	89.227	2.473.791	4.780.913	7.035.887	16.056.174
Production of food products	2.289	139	36	13	3.978	2.601	3.482	6.980	190.600	284.172	567.823	1.121.967
Production of drink products	238	7	2	2	358	165	na	na	19.869	18.600	na	na
Production of tobaccos	2	0	0	0	na	0	0	0	na	0	0	0
Production of textiles	295	24	15	2	531	na	1.492	na	39.439	44.256	na	na
Production of clothing	684	35	7	0	991	682	1.035	0	27.993	56.458	73.515	0
Production of leather and related products	132	8	3	3	217	225	503	1.786	13.681	11.769	50.875	179.153
Processing of wood products, manufacturing of wood, and wood related products, except furniture	1.949	150	27	0	3.321	2.829	3.116	0	222.552	356.000	368.677	0
Paper and paper related products	124	26	11	5	298	579	1.468	2.161	32.841	182.086	278.128	422.991
Chemicals and chemical products	194	26	19	6	329	599	2.063	3.721	48.140	136.474	494.771	717.561
Pharmaceutical raw products	19	4	2	2	38	55	na	na	na	5.918	na	na
Rubber and plastics	751	139	53	11	1.802	3.029	5.868	5.582	198.486	376.762	803.713	696.428
Non metal mineral products	448	54	20	5	882	1.100	2.173	2.642	86.074	176.234	373.565	332.140
Metal	56	24	20	7	139	564	2.461	7.018	17.141	770.930	370.933	1.304.678

Metal products except machines	4.017	569	108	10	8.405	11.500	10.303	5.370	550.323	1.057.385	986.125	633.622
Computer, electronic and optical products	258	51	18	4	541	1.242	1.809	1.962	106.505	165.801	213.513	347.162
Electrical products and machines	298	51	24	21	614	1.073	2.759	16.996	83.790	123.078	301.332	3.296.000
Other machines	515	135	70	10	1.229	2.930	7.994	4.242	147.538	388.038	997.763	698.561
Motor vehicles, campers and semis	127	31	19	15	327	721	2.254	13.667	66.999	113.764	244.286	3.040.702
Other vehicles and vessels	96	10	4	0	147	z	459	0	19.032	13.197	92.750	0
Furniture	1.076	95	10	3	2.184	1.860	963	1.023	124.666	152.944	80.849	96.709
Other manufacturing	766	33	13	2	1.207	na	1.842	na	73.476	78.395	na	na
Repairs of machines and equipment	2.280	123	20	2	3.819	2.280	na	na	274.738	167.010	na	na

INNOVATION AND SUPPORT ENVIRONMENT

Slovenia is currently ranked as a moderate innovator according to European Innovation Index, downgraded for the third year from being considered a strong innovator. This decline is mainly a result of the decline in the innovation activity and investments in the period 2010-2016 as a result of the economic recession and decline in public and private investment in R&D. In the last period (2021) the trend is slightly interrupted due to innovator component, but comparing to other countries the progress is still the second slowest among EU member countries. The main reasons for decrease in status are contributed to:

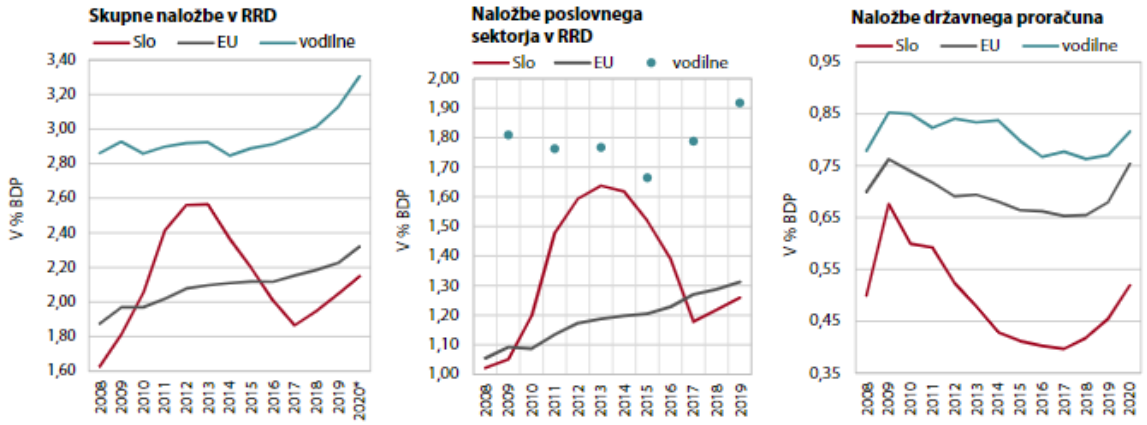
- Low expenditure on non R&D innovation,
- Funding and support
- Low contribution of public sector investment to R&D

Amongst the most improved indicators are:

- Environmental sustainability – improvement of material productivity
- Efficiency of the research and innovation system
- Innovators of products and business processes

Even though in Slovenia the R&D investment has been slightly increasing in the last period, it is still lagging behind the most successful countries in terms of GDP. This lagging behind first started with the economic recession but has been declining until 2016 and it is slightly increasing since. The decline in the R&D investment is seen both in public as well as private investments in R&D activities. Even with the increase in R&D investments Slovenia is still lagging behind, as it is now increasing these investments comparatively to strongest innovating regions.

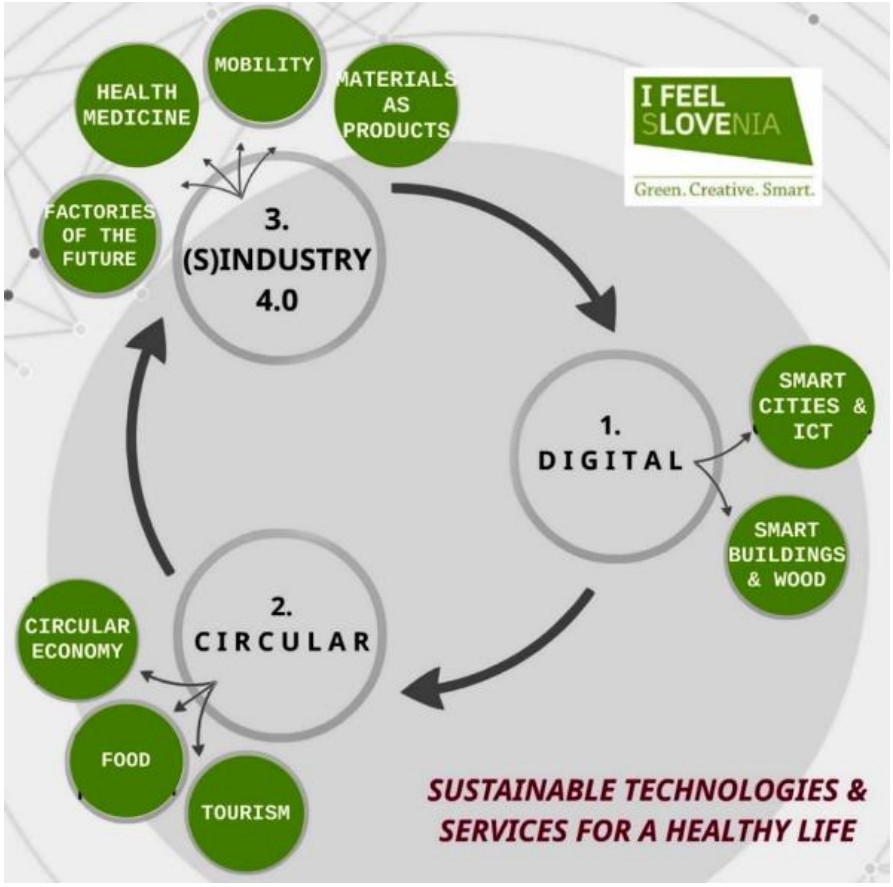
The innovation activity of enterprises returned to pre-decline levels with the last measurement being done for 2016-2018, however the lag of innovation activities is still evident especially among SMEs. The period of 2016-2018 analysis shows that 48,6% of companies are innovation-active. Whereas the large companies have maintained their above EU average and leading innovators average innovation activity, the lagging behind is mostly evident in the medium sized companies.



Vir: Eurostat (2022), SURS (2022); preračuni UMAR.
Opomba: Pri naložbah državnega proračuna za RRD so vključena tudi sredstva, ki se porabijo v tujini (kot npr. za članstvo v CERN-u).

Innovation support environment

Innovation support environment has developed significantly in the last programming period. Through the development and implementation of Slovenian Smart specialisation strategy – S4 **Strategic research and innovation partnerships** (SRIP) have been in established in 3 priority areas and nine domain areas:



These partnerships were selected through an open call, and are financed through 3 phases, with a 50% of funding to support development of its members and services for members.

Based on the selected S4 domains, public calls for R&D activities at the level of TRL 3-6 and TRL 3-9 were published.

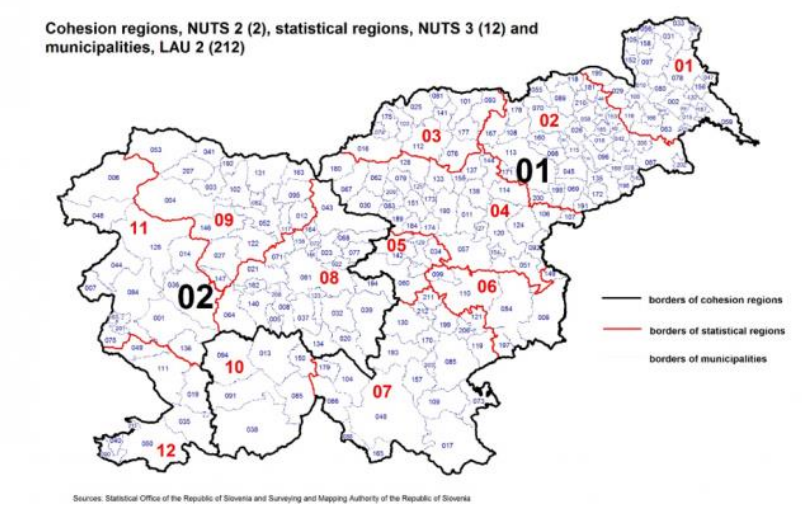
Since 2010 Slovenia has been implementing the mechanism **Entities of Innovative Environment (SIO) and Slovenian Entrepreneurial Points (SPOT)** with the role of supporting registration of businesses, start-up environment and functional technology parks and university incubators, offering non-financial support through mentoring and consulting services to beneficiaries.

Slovene enterprise fund (SPS)[5] offers financial incentives to a range of companies starting from proof of concept funding, to funding of research and prototyping vouchers, digital transformation of companies, transition to circularity of companies etc. The financial support is usually a small scale project ranging from 5.000 EUR – 200.000 EUR and also encompasses guarantees, financial instruments and seed capital.

Technology transfer consortia (KTT) is a consortia of 7 R&D publicly owned institutions supporting commercialization of research results and findings and their transfer to the market.

REGIONAL DISPARITIES

The two cohesion regions do show some relevant disparities arising from historical, logistical and also societal reasons. The Western cohesion Region of Slovenia is considered more developed whereas the Eastern region is considered less developed.



[5] https://podjetniskisklad.si/en

Below there is some comparison of common indicators of the two regions:

- Slovenia's GDP per capita, expressed in standard purchasing power (PPS), in 2019 reached 89 EU average (for the whole Slovenia), two percentage points more than in 2018. Western Slovenia reached 106 on average, and Eastern Slovenia 73 according to Eurostat data.
- The Eastern Cohesion region is larger in terms of population, area covered, number of municipalities. However, taking into account the inhabitants per km2 it is 128,1/km2 in the Western Slovenia and 88,9 inhabitants/km2 in the Eastern Slovenia.
- The educational structure of the two regions is also slightly different, as in the Western Cohesion region the percentage of population with tertiary education is 10% higher than in Eastern cohesion region.
- Whereas the population of the Western Cohesion region mainly remains and works in Slovenia (even though daily migrations between regions are quite common) a large portion of population from Eastern region migrates daily to work, especially in the neighbouring Austria. Given the traditional industrial environment and heritage of the Eastern region, the brain drain jeopardizes the uptake of industrial activities and development of manufacturing companies with highly skilled labour.
- The development vulnerability of regions, measured by the Development Vulnerability Index (IDI), which is a composite indicator for monitoring regional development, is also higher in the Eastern region. The region has mostly lower values of indicators in the areas of economic activity, productivity, employment, investment, educational and demographic structure, with the lowest ranking on being the statistical region of Pomurje
- The number of companies in Cohesion Region Eastern Slovenia (KRVS in 2017 was lower (70,507) than the number of companies in the Cohesion Region Western Slovenia (KRZS) (98,494). In 2016, the ratio of KRVS / KRZ in the number of employees in companies was 44.5% / 55.5%. 10,000 inhabitants in 2017 were also significantly lower (65.41) than the average of Slovenia (89.28) and the Western Cohesion Region (116.07). The turnover of companies in KRVS in 2017 amounted to 38.15% of the revenue of all companies in Slovenia.

CONCLUSIONS

With the above description the following are the main conclusions leading us towards SMARTY project and review of best practices as well as the design of the action plan:

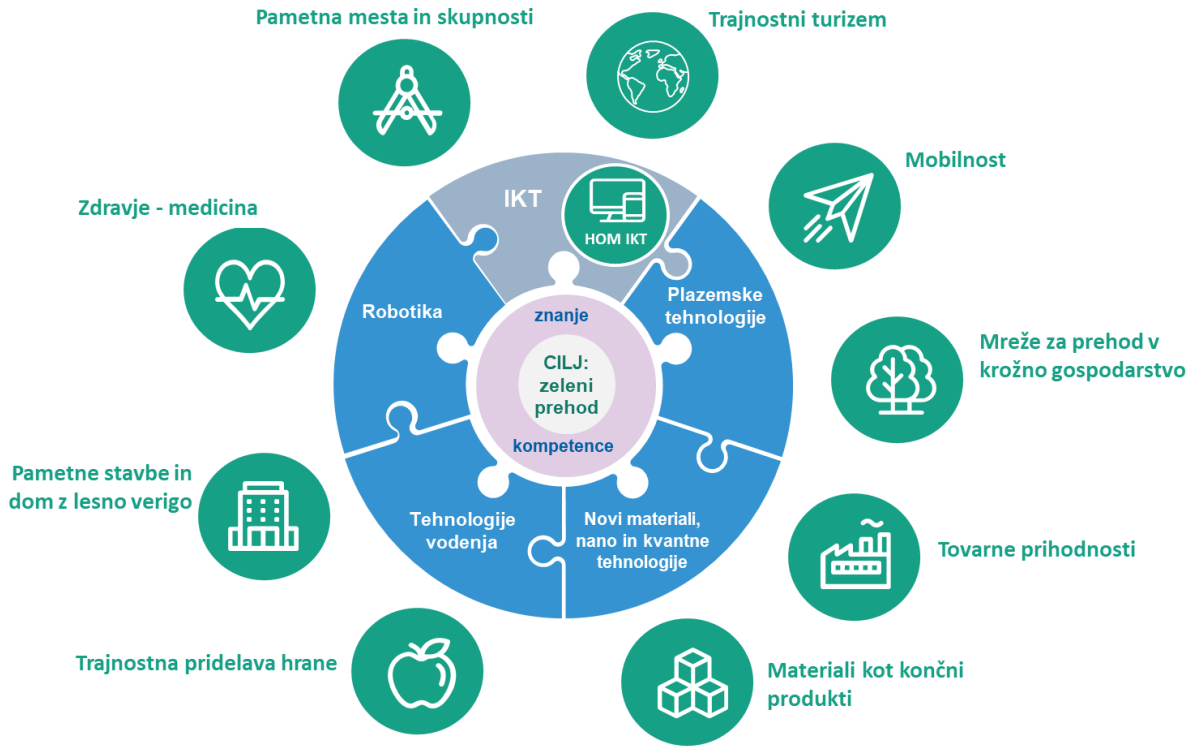
- The key objective of all policies and programmes has to be focused on productivity, reducing the pressure on natural resources and development of innovation support activities.
- In order to maintain productivity and innovation and remain competitive and integrated into national and international value chains, it is necessary to ensure the consistency of support mechanisms, both in terms of content and financial scope.
- The European Commission's report for 2020 for Slovenia points out that further investments in innovation and infrastructure (environmental, transport and energy) are needed.

- In particular, the innovation potential of the economy is hampered by relatively low public investment in research and innovation, and the Commission notes the limited cooperation between science and industry and the unequal innovation and digital capacity of companies.
- Review of existing support schemes revealed that these schemes are not flexible or simple enough to support prototyping and testing of new approaches and products, and access to research and prototyping facilities for SMEs.
- The disparity between two regions has to be addressed in access to research facilities, instruments and knowledge, to stop the outflow of skilled workers and provide for increased innovation in micro, small and medium sized companies.

CONTRIBUTION TO OUR POLICY INSTRUMENT

The SMARTY Action Plan will directly contribute to two policy instruments of Slovenia: the New Slovenian Sustainable smart specialisation strategy – S5 and Programme for the European Cohesion Policy 2021-27. SMARTY Action plan and participation in the SMARTY project also indirectly contributes to already adopted Slovenian Industrial policy 2030, adopted in summer 2021. Whilst in the application form the ECP programme was seen as the main policy instrument, due to the programming process where S5 is a precondition for ECP, and Industrial policy was adopted before S5, we have influenced these three policy instruments through development of the Action plan and participation in SMARTY.

All three policy instruments are of national strategic importance (due to above mentioned national programming approach in Slovenia). The vision of strategic instruments and policies of Slovenia is for Slovenia to become once again considered a »strong innovator« and support development of innovations and competitiveness in the niche markets, defined by S5 strategy. Whereas the Industrial policy is already adopted since 2021, the New Smart specialisation strategy is in the final phase of adjustments in accordance with CPR Regulation. The ECP 2021-2027 programme has been prepared and submitted informally to the EC.



Legend:

Priority areas

- Pametna mesta in skupnosti = Smart cities and communities
- Trajnostni turizem = sustainable tourism
- Mobilnost = mobility
- Mreže za prehod v krožno gospodarstvo = networks enabling transition to circular economy
- Tovarne prihodnosti = factories of the future
- Materiali kot končni produkti = materials as end products
- Trajnostna pridelava hrane = sustainable food production
- Pametne stavbe in dom z lesno verigo = Smart buildings and homes including wood value chains
- Zdravje – medicina = health, medicine

Horizontal networks – key enabling technologies

- IKT – ICT
- HOM IKT – Horizontal network ICT
- Plazemske tehnologije – plasma technologies
- Novi materiali, nano in kvantne tehnologije = new materials, nano and quantum technologies
- Tehnologije vodenja = management technologies
- Robotika = robotics

Human oriented smart specialisation

- Znanje = knowledge
- Kompetence = competencies
- CILJ: zeleni prehod = OBJECTIVE = green transition

Within the Smart specialisation areas, the following support measures are envisioned:

- Improvement in research and innovation capacities and introduction of advanced technologies (supporting investments in research infrastructures and capacities; support to innovation clusters – SRIPs; support to research projects (TRL 1-9); support to projects including KETs; large projects with technological interdisciplinarity; upgrading of Technology transfer offices; pilot and demonstration projects; employment of young researchers in companies and research institutions.
- Improvement in growth and competitiveness of companies and job creation
- Development of knowledge and competencies for smart specialisation, industrial transition and entrepreneurship
- Digital transformation
- Developmental oriented country (support to innovation clusters, technology transfer offices, digital innovation hubs, access to test bed environments, promotion and digitalization awareness, transfer of good practices).
- Measures for industrial transformation (national demonstration center Factories of the future)
- Demonstration project for transition to low carbon society

LEARNING FROM PHASE I OF SMART PROJECTS

The Slovenian partners: Government office for development and cohesion policy and TECOS, Slovenian tool and die development centre have found the SMARTY Interreg process of identification of best practices, exchange of experience and learning opportunities to be extremely useful in the development of the new policy instruments and benchmarking of existing practice towards experience of other regions. In the development of new policy instruments other stakeholders and policy instruments holders such as Ministry of economic development and technology and Ministry of education, science and sports were included, as well as over 90 partners from the Strategic research and innovation partnership Factories of the future.

During the revision of Smart specialisation strategies many of the SMARTY good practices elements were included in the new proposed Smart specialisation strategy.

Smart specialisation strategy support measures	Good Practice
Improvement in research and innovation capacities and introduction of advanced technologies (supporting investments in research infrastructures and capacities; support to innovation clusters – SRIPs; support to research projects (TRL 1-9); support to projects including KETs; large projects with technological interdisciplinarity; upgrading of	Access Innovation Advances manufacturing research center and DIHs in UK The DIHs and comp. In Tuscany

Technology transfer offices; pilot and demonstration projects; employment of young researchers in companies and research institutions.	
Improvement in growth and competitivenes of companies and job creation	Leeds City region skills for growth programme Technological district of Tuscany for the advanced manufacturing
Development of knowledge and competencies for smart specialisation, industrial transition and enterpreneurship	Industry 4.0 Audit
Developmental oriented country (support to innovation clusters, technology transfer offices, digital innovation hubs, access to test bed environments, promotion and digitalization awareness, transfer of good practices).	Industry 4.0 Alliances
Measures for industrial transformation (national demonstration center Factories of the future)	Platform for Industry 4.0 EU Advanced manufacturing center & PIAP Hub
Demonstration project for transition to low carbon society	Laplands green deal Incentives for R&D projects for the productive reconversion of the circular economy

In addition to this, we have taken away the following lessons from SMARTY good practices presented during Phase I of the project:

- Digitization of production processes for sustainable resources management presented in Semester III by ICAMCYL, bringing together the in depth experience on how digitization of production processes for improvement of efficiency of management of resources can be brought together and supported by innovation approaches. Such an interdisciplinary approach is extremely useful to apply to the consequently newly design NDC FOF as we can adopt interdisciplinary approach to Factories of the future, through educational opportunities, skills building in various fields, supported by resources management also in line with the Green transition strategies.
- Advanced Mfg Research Center & DIHs in the UK, presented in semester II by Leeds city region -with a good track record and history on how to develop and established center for demonstration and prototyping, bringing together the whole ecosystem and knowledge, connecting the universities, SMEs and stakeholders on one hand and bringing together the policy and decision makers on the other hand with support mechanism, oriented towards practical results. It was very useful to hear the experiences of bringing together public and private financing schemes and developed approaches towards them.

In addition to that the exchange of experience and best practices, comments and questions arising during the process have also provided valuable lessons on the own instruments already in place, but also on improvements that can be made, thanks to participation in SMARTY:

- The knowledge base, research base and capacities in Slovenia are very comparable to other regions, as well as the research achievements. However, the ecosystem is fragmented, and could be improved by connecting various stakeholders as well as more connected and stable measures and instruments that would enable faster time-to-market process.
- The state-of-the-art of ecosystem in Slovenia is definitely in need of benchmarking and learning of more connected ecosystems, that are coherent. With that in mind the connectivity of such ecosystem has to bring in the existing measures and stakeholders and on the other hand gaps should be filled in with missing instruments and linkages (e.g. pilot and demonstration facilities, simplified support mechanisms and cascade funding).

ACTIONS

ACTION 1:DEVELOPMENT OF THE CONCEPT OF NATIONAL DEMONSTRATION CENTER FACTORIES OF THE FUTURE

THE BACKGROUND

While participating in the SMARTY project, TECOS and GODCP have cooperated with Strategic research and innovation partnership Factories of the future, where we consulted and reviewed the different approaches to boost up and support innovation, prototyping, testing and development of new products and processes, skills building and improving environmental efficiency of SMEs operating in the field of manufacturing which resulted in the project named National demonstration center Factories of the future (NDC FOF).

LEARNING FROM GOOD PRACTICES

The action has been included as a result of the analysis of the ecosystem. Even before SMARTY project exchange of experiences several studies have been conducted in Slovenia (EC, OECD) which have resulted in the conclusions: whereas innovation capacity in Slovenia is satisfying, the SMEs especially lack access to innovation and prototyping facilities (due to funding, resources, …) thus a mechanism that encompasses the whole policy mix is needed. In the revision of the action we have used lessons and good practices from:

- Platform for Industry 4.0 presented by Mazowia is used as a good practice of approach to improving competencies of SMEs and especially their leads – managers and owners to develop a policy approach to engaging the target groups. The access to new technologies and innovations of SMEs in Slovenia is limited due to lack of financial, human resources and knowledge and the Platform for Industry 4.0 provides a good basis for part of the policy mix of the devised National demonstration center.
- Digitization of production processes for sustainable resources management presented in Semester III by ICAMCYL, bringing together the in depth experience on how digitization of production processes for improvement of efficiency of management of resources can be brought together and supported by innovation approaches. Such an interdisciplinary approach is extremely useful to apply to the consequently newly design NDC FOF as we can adopt interdisciplinary approach to Factories of the future, through educational opportunities, skills building in various fields, supported by resources management also in line with the Green transition strategies.
- Advanced Mfg Research Center & DIHs in the UK presented in semester II by Leeds city region -with a good track record and history on how to develop and established center for demonstration and prototyping, bringing together the whole ecosystem and knowledge, connecting the universities, SMEs and stakeholders on one hand and bringing together the policy and decision makers on the other hand with support mechanism, oriented towards practical results. It was very useful to hear the experiences of bringing together public and private financing schemes and developed approaches towards them.

ACTION

TECOS, GODCP, the Strategic research and Innovation partnership Factories of the Future, will based on experiences of partners of SMARTY projects, prepared external studies (EC, OECD) develop a potential strategic instrument of supporting especially micro and SMEs towards faster implementation of innovations, developing innovations, prototyping, testing and building competencies of SMEs. The action will start taking place in February 2021 and is planned to be completed by February 2022.

Development of a full concept joining together all relevant stakeholders, for a hub and spoke model of a diversified demonstration center enabling SMEs in Slovenia to:

- Access open innovation facilities supported by mentors, experts
- Development of a digital twin platform, that would interconnect all knowledge
- Development of a wholesome policy mix, that was proposed to relevant ministries for inclusion into the relevant policies and programmes
- Inclusion of FOF NDC into the S5 as well as in the Industrial policy and relevant programes of Ministry of economic development and technology in Slovenia.

ACTION 1A – IDENTIFICATION OF NEEDS AND POTENTIAL FOR FUNCTIONING OF NATIONAL DEMONSTRATION CENTER FACTORIES OF THE FUTURE

Several external studies of the Slovenian ecosystem have been already developed which identified the need for more coherent support mechanisms and policies as well as a simplified access to innovation and prototyping. Furthermore, the premises of the need for Industrial transition, and transition to Industry 4.0, was already tested. Based on that and the exchange of experiences in SMARTY a needs assessment study will be conducted. This will be done in the group within Strategic research and innovation partnership Factories of the future and its members, as well as through the members channels (Chamber of commerce and Industry, TECOS, GODCP). A comparative study will also be included for the feasibility of such a center.

ACTION 1B – DEVELOPMENT OF THE NATIONAL DEMONSTRATION CENTER CONCEPT

Based on the identification of needs as well as existing experiences, from SMARTY project, and other experiences, we will develop a concept of National demonstration center Factories of the future. The national demonstration center concept will be developed by inclusion of the relevant stakeholders: Government office for development and cohesion policy, Ministry of Economic development and technology; Ministry of Science, Education and sports, but will be led, by the relevant innovation cluster: Strategic research and innovation partnership Factories of the future6.

During this phase the following should be identified:

[6] SRIP FOF is one of the 9 clusters supported by the S4 of Slovenia, and is representing over 90 members

- Model of operation development (centralized location, co-locations, set up of Platform)
- Development of a proposed policy mix (infrastructure development, activation and operation; support schemes such as prototyping vouchers, SME skills development vouchers, mentorship schemes, IPR and patent resolutions,…)
- Financial calculation proposals for the proposed policy schemes, to be proposed and included in S5 and for ERDF financing.
- Development of a timeline based on adoption of the financial scheme
- tasks distribution and activities,
- Focus definitions based on needs of the target market

ACTION 1C – INTRODUCTION OF NATIONAL DEMONSTRATION CENTER TO A WIDER AUDIENCE AND STAKEHOLDERS

Based on the developed concept, it will be presented to stakeholders at events (during the Policy development actions and events, outside events, presidency of Slovenia to EU)

ACTION 1D – INCLUSION IN POLICY INSTRUMENTS

The concept will be proposed and included in the relevant policy instruments (Industrial policy, Slovenian sustainable smart specialisation strategy, OP ERDF).

PLAYERS INVOLVED

The activity was led by TECOS, Slovenian tool and die development centre as well Government office for development and cohesion policy. Other stakeholders involved were:

- Strategic research and innovation partnership Factories of the future (beneficiaries within OP ERDF are: Josef Stefan Institute, Chamber of commerce and Industry of Slovenia, Competence center for management technologies, TECOS – representing 92 members.
- Ministry of economic development and technology
- Ministry of science, education and sports
- University of Ljubljana, Faculty of mechanical engineering

TIMEFRAMES

Milestone	Completion Date
IDENTIFICATION OF NEEDS AND POTENTIAL FOR FUNCTIONING OF NATIONAL DEMONSTRATION CENTER FACTORIES OF THE FUTURE	April 2021
DEVELOPMENT OF THE NATIONAL DEMONSTRATION CENTER CONCEPT	June 2021
INTRODUCTION OF NATIONAL DEMONSTRATION CENTER TO A WIDER AUDIENCE AND STAKEHOLDERS	December 2021
INCLUSION IN POLICY INSTRUMENTS	March 2022

COSTS

The development of the concept will be financed through multiple financial streams.

FUNDING

The following funding is envisioned:

- P ECP 21-27
- National recovery and resilience plan
- Own sources
- Sources from SRIP FOF.

RESULT INDICATORS

- Inclusion of a number of stakeholders involved and support letters by stakeholders
- Concept model of NDC FOF

ACTION 2: NATIONAL DEMONSTRATION CENTER FACTORIES OF THE FUTURE POLICY MIX IMPLEMENTATION

THE BACKGROUND

While participating in the SMARTY project, TECOS and GODCP have cooperated with Strategic research and innovation partnership Factories of the future, where we consulted and reviewed the different approaches to boost up and support innovation, prototyping, testing and development of new products and processes, skills building and improving environmental efficiency of SMEs operating in the field of manufacturing which resulted in the project named National demonstration center Factories of the future (NDC FOF).

LEARNING FROM GOOD PRACTICES

The action has been included as a result of the analysis of the ecosystem. Even before SMARTY project exchange of experiences several studies have been conducted in Slovenia (EC, OECD) which have resulted in the conclusions: whereas innovation capacity in Slovenia is satisfying, the SMEs especially lack access to innovation and prototyping facilities (due to funding, resources,…) thus a mechanism that encompasses the whole policy mix is needed. In the revision of the action we have used lessons and good practices from:

- Platform for Industry 4.0 presented by Mazowia is used as a good practice of approach to improving competencies of SMEs and especially their leads – managers and owners to develop a policy approach to engaging the target groups. The access to new technologies and innovations of SMEs in Slovenia is limited due to lack of financial, human resources and knowledge and the Platform for Industry 4.0 provides a good basis for part of the policy mix of the devised National demonstration center.
- Digitization of production processes for sustainable resources management presented in Semester III by ICAMCYL, bringing together the in depth experience on how digitization of production processes for improvement of efficiency of management of

resources can be brought together and supported by innovation approaches. Such an interdisciplinary approach is extremely useful to apply to the consequently newly design NDC FOF as we can adopt interdisciplinary approach to Factories of the future, through educational opportunities, skills building in various fields, supported by resources management also in line with the Green transition strategies.

- Advanced Mfg Research Center & DIHs in the UK, presented in semester II by Leeds city region -with a good track record and history on how to develop and established center for demonstration and prototyping, bringing together the whole ecosystem and knowledge, connecting the universities, SMEs and stakeholders on one hand and bringing together the policy and decision makers on the other hand with support mechanism, oriented towards practical results. It was very useful to hear the experiences of bringing together public and private financing schemes and developed approaches towards them.

Considering the NDC FOF is a policy mix of instruments, the following good practices supporting innovation and ecosystem development have also been taken into account:

- Access Innovation
- Advances manufacturing research center and DIHs in UK
- The DIHs and comp. In Tuscany

ACTION

After the development of the concept and its inclusion into the policy instruments a detailed development of policy mix, its inclusion in the P ECP 21-27, and implementation is needed. With this in mind the focus of the developed NDC FOF is:

- Open access to innovation and prototyping facilities for development and testing of innovations, at the TRL level 7-8, to speed up time to market,
- Access to testing facilities, to test solutions, and resolve obstacles
- Capacity and skills building facilities for specific niche markets and needs based on the bottom up approach of the needs and competencies in environment
- Set up of an interconnected national digital twin platform to interconnect all knowledge

ACTION 2A- PROMOTIONAL ACTIVITIES

To spike a wide based interest among Slovenian SMEs on one hand, and experts at the other hand a wide promotional campaign will be conducted to gather attraction. This will be done at various events, as per stakeholders listed above and will also provide a lobbying instrument for faster implementation.

ACTION 2B – SET UP OF THE HUB-AND-SPOKE MODEL WITH DIGITAL TWIN PLATFORM

A joint consortia of at least 7 facilities will be set up based on the defined knowledge base and needs of the market for set up of such a center. The facilities will be equipped with a joint digital twin platform interconnecting knowledge and expertise but also experiences along the following main fields:

- Robotics
- Smart mechatronics
- Photonics

- Smart plasma systems
- Advanced materials
- Advanced management technologies
- Advanced sensorics

Each facility will be based on open innovation approach supported by mentors, experts and supported by below listed support schemes. The consortia will apply for national ERDF funding through a joint application and obtain funding for the equipment costs and materials costs as well as overheads for functioning of facilities.

ACTON 2C – SET UP OF SUPPORT SERVICES FOR NATIONAL DEMONSTRATION CENTRE FACTORIES OF THE FUTURE

To provide access to demonstration and prototyping facilities a set of support measures will be implemented by relevant Ministries and implementation actors/institutions. This will range from:

- Prototyping vouchers
- Simplified cascade funding mechanisms
- Start up support
- IPR and patent registration support
- Skills development programmes vouchers and implementation.

PLAYERS INVOLVED

The activity will be lead by SRIP Factories of the future as the coordinating institution and lead partner, with consortia being set up based on specialisation of colocation. The application will be coordinated by the same (if the implemented instrument will allow for consortia). Other stakeholders involved were:

- Josef Stefan Institute,
- Chamber of commerce and Industry of Slovenia,
- Competence center for management technologies,
- TECOS
- GODCP
- Ministry of economic development and technology
- Ministry of science, education and sports
- University of Ljubljana, Faculty of mechanical engineering
- SPIRIT, Public agency
- Slovene entrepreneurship fund

TIMEFRAMES

Milestone	Completion Date
PROMOTIONAL ACTIVITIES	July 2022
SET UP OF THE HUB-AND-SPOKE MODEL WITH DIGITAL TWIN PLATFORM	December 2022
SET UP OF SUPPORT SERVICES FOR NATIONAL DEMONSTRATION CENTRE FACTORIES OF THE FUTURE	April 2023

COSTS

The development of the concept will be financed through multiple financial streams. The full estimate is 85 million EUR.

FUNDING

The following funding is envisioned:

- O ECP 21-27
- National recovery and resilience plan
- Own sources
- Sources from SRIP FOF.

RESULT INDICATORS

- Number of colocations set up
- Number of support instruments implemented
- Allocated funding

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Ljubljana, 22.5.2022
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