Knowledge transfer in the BRIDGES project

How, under what conditions, can research-to-business cooperation between advanced and less advanced regions lead to win-win results and types of development approaches?

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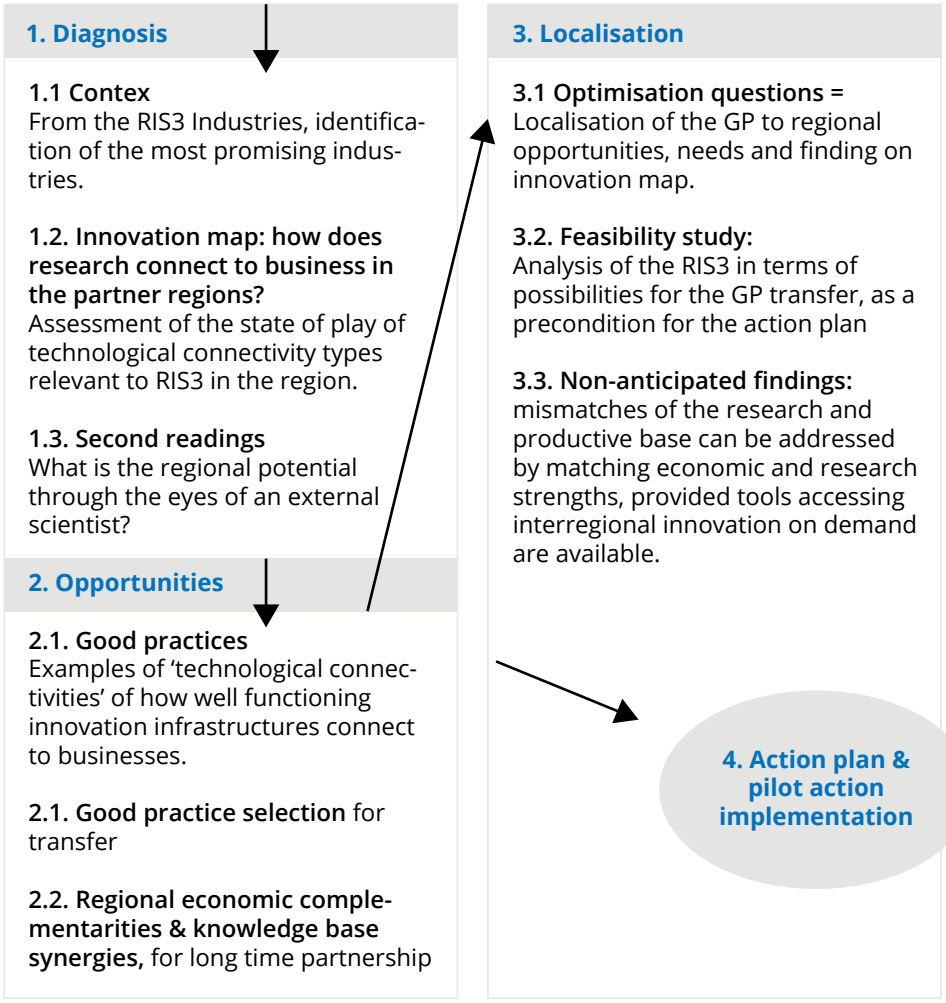
Pre-condition: Bio-based industies part of the RIS3 if all partner regions



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Abbreviations

AP Advisory partner

AR Advanced regions

BSR Baltic Sea Region

CC Centres of Competence (Industry led)

EDP Entrepreneurial discovery process

ERDF European Regional Development Fund

ES Spain

FI Finland

GP Good practice

GR Greece

HU Hungary

IE Interreg Europe programme

IR Intermediate regions

LAR Less advanced regions

MS Member state

PDL Project development lab

PL Poland

PP Project partner

RTO Research and Technology Organisations

RTTO Research and technology transfer organisations

SF Structural Funds

SI Slovenia

Knowledge transfer in the BRIDGES project

a case study

1.

Executive summary

1.1 Overview

The BRIDGES project added value is in the

• **concrete, tangible outputs:**
new products that have resulted from research-business partnerships;

• **enabling outputs:**
policy improvements integrating the lessons learnt through the project and mainstreaming the relevant, successful aspects of the research-to-business partnerships;

• **conceptual contributions:**
solutions implementing research-to-business objectives and tools for win-win cooperation schemes between advanced and less advanced regions. It advances the argument that such co-operations can contribute to advanced regions' RIS3 economies of scale through growth and diversification; while they can contribute to less advanced regions' RIS3 economies of scope, through specialisation and growth. In this process, innovation infrastructures such as industry-led centres of competence (CCs) and research & technology transfer organisations (RTOs) are essential for their specialised knowledge flows and methodological know how. Thus, it contributes to concretising operational and tactical aspects of the regions' RIS3.

1.2 Reminder

The BRIDGES project, ***Bridging competence infrastructure gaps and speeding up growth and jobs delivery in regions*** is an Interreg Europe project approved under the first call on 10.2.2016 and ending on 31.3.2021.

It is a 5-year project, 3 years dedicated to policy learning (Phase 1) and 2 years dedicated to the implementation of action plans (Phase 2), with a total budget of 1 807 696,00€, 85% funded by the Interreg Europe programme.

BRIDGES was approved under Specific objective 1.1 Improving innovation infrastructure policies. The project partnership brings together ten partners, seven project partners (PP) and three advisory partners (AP). One of the advisory partners withdrew at the start of the project, so the project implementation relied finally on seven PPs and two APs:

1-LP	Kainuun Etu ltd, Finland
2-PP	Regional Council of Kainuu, Finland
3-PP	Lubelskie Voivodeship, Poland
4-PP	Helsinki-Uusimaa Regional Council Regional Development, Finland
5-PP	Regional Development Agency of West Macedonia SA- ANKO, Greece
6-PP	Soča Valley Development Centre, Slovenia
7-PP	Pannon Business Network Association, Hungary
8-AP	European Business and Innovation Centre of Burgos, Spain
9-AP	Centre for Research & Technology-Hellas / Institute for bioeconomy and Agri-technology, Greece
10-AP	Stichting DLO (withdrew in November 2016), The Netherlands

1.3 Project objective

The overall objective of the project is to benefit from the policy learning, i.e. good practice (GP) exchange, regional analyses & inputs from the advisory partners, to improve the delivery of the structural funds of the partner regions and in particular of the Thematic Objective 1 (TO1) under which RIS3 is planned and implemented.

This is achieved by adopting good practices (GPs) enhancing the effectiveness of industry-led Centres of Competence (CC) as RIS3 innovation infrastructure units. The main outputs at the end of the first 3 years (Phase 1) of the project implementation are the policy review (end of the first semester of the project, October 2016), regional analyses -i.e. the regional innovation maps and related capitalisation report, a discussion on “2nd readings” of the regional potential, selection and documentation of good practices & related capitalisation report, and 6 action plans approved by the respective project partners (PP) as well as by their respective managing authorities (MA) or intermediate bodies (IB).

The main outputs at the end of Phase 2 (2 years) are the results of the implementation of the action plans, policy impacts, evaluation reports and insights.

The overall objective of the project is to benefit from the policy learning.

1.4 Results, briefly

The BRIDGES project completed Phase 1 on 31.3.2019 and the first year of the Phase 2 implementation ends on 31.3.2020. According to the project partners[1], the most important results of the project are:

Kainuun Etu ltd[2] and Regional Council of Kainuu[3], Finland

Most important challenge in the region:
To set up the criteria for & upscale investments in Bio-based economy; to address partnerships addressing region's RIS3 mismatches between productive & RDI base; to enhance centres of expertise and innovation for a better RIS3 implementation and to leverage additional resources for innovation.

Action plan focus:
To enhance circular economy by supporting the establishment of new product lines based on forest side-flows valorisation; to commercialise Kainuu-based research results through research-to-business partnerships; to contribute to the modernisation of Kainuu's natural resources industries.

BRIDGES project started one new product line from scratch in Kainuu, the lignin – based adhesives for the wood processing industry and replace synthetic adhesives. It developed one new S3 partnership (BERRY+) and implemented two mini-projects through the pilot action.

Knowledge transfer priority:
Transfer of good practices – BioSC as a good example of introducing an emerging industry as a new market in the region; entrepreneurial discovery process for tailoring the lignine processing to end-users as an emerging market.

[1] Inputs based on semi-structured interviews, during the period 1.1.2020-1.3.2020. The interview template can be found in Annex 1.

[2] PP1 KE, Antti Toivanen, Managing Director 7.2.2020

[3] PP2 RCK, Jouni Ponnikas, Regional Development Director 7.2.2020

Most important benefit from the project:
BRIDGES project started one new product line from scratch, the lignine – based adhesives for the wood processing industry and replace synthetic adhesives. The required research for developing the proof of concept is on-going. Through the pilot action (Action 3 of the action plan) it funded two (2) mini projects commercialising measurement technology research results beyond Finland. It submitted an S3 industrial modernisation partnership proposal to the EC's Joint Research Centre, got it approved, and committed to setting up an interregional cluster. Another positive result has been the strong level of commitment from the Intermediate Body and the regional stakeholders' group in terms of the Action Plan implementation support.

Most challenging aspect of the action plan implementation: One challenge was that the readiness of small businesses to absorb science-based development was not mature. Another challenge was the time schedule of the action plan which should be aligned with the actual availability to avoid delays in the implementation.

Lubelskie Voivodeship[4], Poland

Most important challenge in the region:
Addressing existing gaps in regional innovation system: more tailored offer of scientific centers for companies (limited cooperation of companies with public R&D institutions); more tailored support of Business Support Institutions for companies (from project idea to formal application for subsidy); regional instruments supporting innovation better aligned to the needs of SMEs.

Action plan focus:
Improving the uptake of the Lubelskie ROP funding by SMEs and expanding to benefit from national resources: thanks to information meetings companies are more aware of services offered by research&technology transfer organisations of regional universities, and possibilities of getting subsidy for implementation of innovative projects.

[4] PP3 LuVo

The dialogue led to creating better conditions of the calls for proposals and resulted in higher number of companies applying to innovation calls.

Knowledge transfer priority:
Transfer of project good practice – Autodiagnostic tool as a tool to address the existing gaps: thanks to the audits carried out with the adapted tool ROP Managing Authority got feedback from large group of companies on their level of innovation readiness, research topics they are interested in and barriers of cooperation with R&D sector.

Most important benefit from the project:
Thanks to BRIDGES project an effective dialogue between companies, MA and RTTOs was initiated. Companies saw, that they can really influence policy makers and make a change of policy instrument. The dialogue led to creating better conditions of the calls for proposals keeping the same strategic goal, raising awareness of companies about photonic technology and resulted in higher number of companies applying to innovation calls.

Most challenging aspect of the action plan implementation:
Despite many efforts to enhance companies to involve in innovation projects there is still need to rise companies' awareness that R&D works are crucial for their development and competitiveness. Further steps have to be taken to demonstrate and promote RTTO's activity to the companies, as many of SMEs still do not know or are sceptical about possibilities of cooperation with R&D sector.

Helsinki-Uusimaa Regional Council Regional Development[5], Finland

Most important challenge in the region:
Internationalization of research results in order to expand the economic base and the applications of research: need to increase commercialisation of research including bio-based industries; need to seek globalised triple helices and activate regional networks to support the process; need to address research-to-SMEs and research-to-industry.

Action plan focus:
Enhancing new services aiming at providing facilitation of internationalisation of the regional research and innovation base and influencing and modification of ERDF calls concerning internationalisation and commercialisation accordingly, which ultimately will support the commercialisation of bio-based research at regional and interregional levels.

Knowledge transfer priority:
Transfer of good practices as new research to businesses opportunities – renewal of the berry industry, knowledge intensive platform for the development of aquaculture as blueprints for future developments. Interregional technological connectivities.

Most important benefit from the project:
The policy change was not a special challenge, because it is a very relevant issue which needed to be taken into consideration anyway, however, BRIDGES brought a good forum and tools to tackle these questions, being project stakeholders' role considered as essential, in particular the participation of RTO's such as VTT, taking into account the next programme period and its perspectives.

BRIDGES brought a good forum and tools to tackle key questions, being project stakeholders' role considered as essential.

[5] PP4 HURC

Most challenging aspect of the action plan implementation:
Limited resources allocated, which are not enough for a proper implementation. Despite the communication efforts made, some of the stakeholders did not sufficiently support the action plan. It would have been convenient to have less bureaucracy and resources enough for both implementation phases.

Regional Development Agency of West Macedonia SA- ANKO[6], Greece

Most important challenge in the region:
Weak absorptiveness of research excellence of the RIS3 industries and the economy in general; Low effectiveness of innovation management, including RIS3 implementation; RIS3 implementation needs to increase its effectiveness; Clusters for growth and innovation weak.

Action plan focus:
The action plan aims at improving innovation & SME competitiveness through investments addressed by the region's ROP, the establishment of a RIS3 interactive platform and the improvement of policy instrument governance focused on opening of region's ROP to interregional R2B co-operations. The improvement concerns the deeper region's RIS3 specialization through good practice's transfer and exchange of experience between research centres and businesses.

A more efficient cooperation between research centres and businesses of the different participant regions.

[6] PP5 ANKO

Knowledge transfer priority:
Transfer of good practices - Autodiagnostic tool as an efficient way to assess the innovative state of businesses. Mini projects as part of the pilot action guiding further to follow up actions that will be financed by structural funds (ROP of the region), sharing common proceedings with the rest of the regions which participate in the pilot action.

Most important benefit from the project:
BRIDGES project has transfered new ideas and concepts in the content of bio-economy to the MA and other relevant stakeholders in terms of RIS3 implementation.
It is expected that after the implementation of the actions included in the AP the innovation status of the businesses involved will be increased, along with a more efficient cooperation between research centres and businesses of the different participant regions.

Most challenging aspect of the action plan implementation:
The cooperation with the MA, as the time schedule of the AP endorsement has been extended mainly because of the bureaucratic procedures. Furthermore, the endorsement of INTERREG policy change proposals by mainstreaming programmes (e.g. ROP) should be encouraged. Actual involvement of stakeholders, as they play a crucial role in terms of public awareness and dissemination of the project to potential beneficiaries.

Soča Valley Development Centre[7], Slovenia

Most important challenge in the region:
Improvement of infrastructure for research and innovation and enhancement of capacities for excellence in this area in accordance with the RIS3. The industry focus is agri-food and aquaculture in terms of improvement of quality, clustering, and linkages to new product lines.

[7] PP6 SVDC Miro Kristan, 6.2.2020

Action plan focus:
The action plan is about fostering a policy change in the policy instrument addressed (Investment for Growth and Jobs programme, CLLD) and designing and implementing aquaculture development actions in terms of new products and a knowledge intensive platform).

Knowledge transfer priority:
Transfer of good practices - The transition from a national to a regional approach.

Most important benefit from the project:
BRIDGES project has accomplished the policy change expected, along with the new product to be in the market and the knowledge intensive platform to be developed. The cooperation with MA was positive in terms of support towards the policy change and implementation of the action plan.

Most challenging aspect of the action plan implementation:
MA active involvement in the project partnership (participation at project events). The time needed for the whole process, since the majority of the industry players are SMEs which cannot invest a lot of time in acitivities out of their primary daily commitment. The timeline of the implementation is not aligned with the timeline of the funding. The rhythm of the implementation should be aligned with the disbursement of the funds.

The stakeholders have been involved from the very beginning and the mapping of their needs confirmed what the regional inovation map previously showed.

Pannon Business Network Association, HU

Most important challenge in the region:
The furniture industry based on wood processing, is a traditionally important sector of the Hungarian economy, and one among those prioritized for economic renewal. It includes an extensive SME base as well as FDIs. However, as indicated also in the innovation map, the economic and innovation performance of the wood processing industry needs to be improved.

Action plan focus:
To renew the wood processing furniture industry by digitisation of businesses including, eventually, additive manufacturing applications as the main challenge to be addressed.

Knowledge transfer priority: Transfer of good practices – KANTOLA GP designed implementation methodology.

Most important benefit from the project:
As a result of BRIDGES project implementation, a stable group of regional stakeholders was established and the goal is to consolidate it as a long-term regional development platform supporting the digitisation of the wood furniture industry. All representatives of the quadruple helix were invited to the stakeholder group which was a unique approach and boosted the communication, idea & project generation and above all a regional consensus building tool. After sharing these experiences and becoming aware of the needs and experiences of all level of stakeholders, a tailored tool was developed which is not just a theoretical approach but also based on real needs of wood & furniture industry. Outcomes and results of BRIDGES can help the planning of structural funds for the upcoming periods”

A stable group of regional stakeholders was established and the goal is to consolidate it as a long-term regional development platform supporting the digitisation of the wood furniture industry.

Most challenging aspect of the action plan implementation:
The biggest challenge in the AP implementation is that the period 2014-2020 is about to be closed and most of the structural funds are not available anymore. As a consequence, the Action Plan should have been earlier formulated and endorsed.

1.5 Structure of the document

The present document is structured into six (6) parts:
1. Executive summary
2. Background and motivation
3. Project documentation
4. Feedback to the research questions, insights & conclusions
5. Annexes
6. Useful readings

2.

Background and motivation

This section's intention is to discuss the conceptual & theoretical background, the project-generated inputs, and the research questions that guided the overall effort.

An Introductory part discusses the overall project motivation and positioning.

2.1 Introduction

The BRIDGES project was planned from the perspective of improving the RIS3 governance in the direction of achieving RIS3[9] - **related investments in the regions - a priority among project partners coming from the less advanced regions and mainstreaming the associated methods into regional policies - an expectation shared by each Interreg Europe projects.**

The project abstract argues that "BRIDGES regions face challenges deriving from the effectiveness of their RIS3 implementation[9]. In some cases, such challenges relate to the process of valorising research results, while in other cases they relate to the transformation & renewal of regional economies". The overarching improvement need for the RIS3 implementation, i.e.
1) relatively weak impact of RIS3 on growth, jobs & regional economy renewal (linked to low upscale investments, research excellence absorptiveness, and exploitation of related variety potential),
2) mismatches between RIS3 productive & RDI bases,
3) distance from & better exploitation of research excellence as a path to further specialisation,
4) restricted resources towards RIS3 impact, is achieved by exploring the potential and good practices of industry-led centres of competence in terms of form, processes, and governance.

The project was planned from the perspective of improving the RIS3 governance in the direction of achieving RIS3[10].

[9] The BRIDGES project was planned during 2014 & 2015, when the RIS3 policies and their implementation, were still relatively new.

[10] RIS3 = Regional Innovation Smart Specialisation Strategy.

The BRIDGES project would not have been possible without the empirical and theoretical inputs that form its conceptual & strategic framework:

The empirical inputs derive for the most part from project- and article related long-term cooperation among several of the partners, to a large extent thanks to Interreg III C, Interreg IV C and Horizon 2020 WIDESPREAD programmes. They also derive from the experience of macro-regional strategies and associated innovation projects, especially the Baltic Sea Region strategy and programme. Finally, they derive from the experience of researchers and regions with policies, including national innovation policies, RIS3 planning and implementation studies, as well as the Finnish Centre of Expertise programme tested between mid 1990s and mid 2000s.

The conceptual inputs relate to the concepts of evolutionary economic geography and especially on constructed regional advantage; on differentiated and distributed knowledge bases, knowledge spillovers, and types of knowledge proximities; on RIS3 literature as well as lessons learnt from prior examples of innovation strategies converging to RIS3, such as the Finnish Programme of Centres of Expertise[11] 1994-2006 and 2007-2013; and the extensive initiatives on research and technology transfer, e.g. EARTO[12], centres of excellence[13], and industry – led centres of competence, including the work done in 2008 in the CREST project[14].

[11] The Centres of Expertise Programme (OSKE), focus: 1st period 2000-2007: focusing on regional centres of competence and innovation; 2nd period: 2007 – 2013: National cluster development, cluster management, and internationalisation. General goals of the cluster programme are: - Development of innovations, new products and services, foundation of new business ventures and the creation of jobs based on top-tier expertise; - Encouragement of a broad specialisation with the aim of establishing independent centres of excellence; - Enhancing the attractiveness of the regional innovation system in order to continuously entice enterprises from abroad, investors, leading experts and knowledge carriers. In order to achieve these goals, the Centre of Expertise Programme focusses on the following priorities: - Concentration on the development of selected competence networks and international centres of expertise working at the highest standards of excellence; - Use of top-tier regional expertise in order to strengthen the long-term competitiveness of Finnish enterprises and to develop new business models; - Encouraging the co-operation of centres of excellence at national and international level; - Collection and allocation of regional, national and European funds to further develop selected key industries; - Ensure that the requirements for drawing on the various national and international financial resources for R&D support are met by the regional entities.

Structural funds 2013-2020 programmes of the six regions, at regional and national levels, including any internationalisation provisions mentioned in the regional operational programmes and strategies[15].

National Research and innovation strategies, especially those explicitly committed to internationalisation of research, such as the Finnish strategy[16].

The common provisions regulation 2013-2020, 1303/2013 REGULATION[17], with the activation of Article 70 as a starting point. It was later found out that it was not required for Article 70 to be activated.

https://ec.europa.eu/regional_policy/en/projects/finland/centre-of-expertise-programme-implementing-the-multipolis-network

https://www.clusterplattform.de/CLUSTER/Redaktion/EN/Downloads/europe/finnland.pdf?__blob=publicationFile&v=2

[12] Website EARTO: http://www.earto.eu/about-rtos.html .

[13] Finland Centres of Excellence, Academy of Finland, https://www.aka.fi/en/research-and-science-policy/centres-of-excellence/.

[14] Final report to the CREST (European Union Scientific and Technical Research Committee) Working Group, 2008. Industry-Led Competence Centres – Aligning academic / public research with enterprise and industry needs, Open Method of Co-ordination (OMC) 3% Action Plan.

[15] Uudenmaan Liitto, Uusimaa Programme 2.0. https://www.uudenmaanliitto.fi/dynastia32/kokous/20171033-3-1.PDF, retrieved 6.1.2019.

[16] FIRI the Finnish research infrastructure committee), AKA (Academy of Finland), MINEDU (Ministry of Education), 2014. Finland's strategy and roadmap for research infrastructures 2014-2020. Page 3, stressing quality of research, impact, and internationalisation.

[17] REGULATION (EU) No 1303/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Of 17 December 2013), Page 378 Article 70 Eligibility of Operations depending on Location, §2 And Page 415 Annex 1, COORDINATION AND SYNERGIES BETWEEN ESI FUNDS AND OTHER UNION POLICIES AND INSTRUMENTS.

2.2 Conceptual & theoretical background

2.2.1 Constructing regional advantage as a tool for effective RIS3 implementation

Constructing regional advantage (CRA) is a place-based, systemic approach, especially emphasising the benefits of localised cross-industry potential (related variety), which can be understood as one type of entrepreneurial discovery. It is part of the Evolutionary Economic Geography theory as to how regions can & do change[18]. Evolutionary Economic Geography builds on the concepts and arguments discussed in Evolutionary Economics. Evolutionary economics examines how and why the economy changes, i.e. it deals with the dynamics of economic systems in historical time[19]. Evolutionary economists undertake both deductive and inductive research (Boschma and Frenken, 2006, 291). Evolutionary economics is not a new concept (Dopfer 2007, Richard R. Nelson and Sidney G. Winter (2002)). However, it sees a revival in the interim of the last 30 years as it deals with "... the broader question of how better routines and more effective ways of doing things get created and spread.

[18] For example: - Asheim, B.T., Boschma, Ron A., Cooke, Phil, 2011. Constructing regional advantage. Platform policies based on related variety and differentiated knowledge bases. Regional Studies, Taylor. Francis (Routledge), 2011, 45 (06), pp.1-12. <10.1080/00343404.2010.543126>. <hal-00681956> https://hal.archives-ouvertes.fr/hal-00681956/document. – Asheim, B.T., , I & Boschma, Ronon & Cooke, Philip & Lindholm Dahlstrand, Åsa & Brzica, Daneš & Lareda, P & Piccaluga, Andrea. (2006). Constructing regional advantage. Principles, Perspectives, Policies.

[19] Exploring Economics, https://www.exploring-economics.org/en/orientation/evolutionary-economics/ .

This thread of analysis leads into a theory of technological and institutional change and economic growth". (Richard R. Nelson and Sidney G. Winter (2002) page 25).
One of the important aspects of Evolutionary economics is that it has interdisciplinary characteristics which can benefit other disciplines besides economics: "More generally, evolutionary economics offers great advantages in areas where interdisciplinary dialogue is needed for progress. .... this is primarily because the evolutionary view of firm and organisational behaviour, which stresses the bounds on rationality, is broadly consistent with prevailing views of firm behaviour outside economics". (Richard R. Nelson and Sidney G. Winter (2002), page 42). The interdisciplinarity potential linked evolutionary economics to regional innovation system theories, as innovation is a tool, a cause and an objective of regional economies: "In summary, change is mainly explained at the meso-level[20] and can be integrated or limited by structures at the micro and macro level (Dopfer et al, 2004[21])."

In the BRIDGES project, constructing regional advantage (CRA) goes through the research-to-business partnerships & the innovation infrastructures as tools for strengthening RIS3 – associated bio-based industries in the partner areas.

[20] Boschma, R.A., Koen Frenken (2006). Why is economic geography not an evolutionary science? Towards an evolutionary economic geography: Journal of Economic Geography, Volume 6, Issue 3, 1 June 2006, Pages 273–302, https://doi.org/10.1093/jeg/lbi022 . https://academic.oup.com/joeg/article/6/3/273/934947, retrieved 5.1.2019, page 29 "Macro – level: the spatial system; meso-level: sector (population)& networks (population); micro-level: firms (routines)."

[21] Dopfer, K., Foster, J., & Potts, J. (2004). Micro-meso-macro: Journal of Evolutionary Economics, 14(3), 263-279. Evolutionary economics: https://www.exploring-economics.org/en/orientation/evolutionary-economics/.

The focus is on combining regional resources with research competences towards new products. This is aligned with the initial approach proposed by Foray "the issue of specialisation in R&D and innovation" (Foray et al., 2009, page1[22]) and adopted by the EC that conceived RIS3 as specialisation through R&D: "… smart specialisation …. takes account of the differing capacities of regional economies to innovate. *While leading regions can invest in advancing a generic technology or service innovation, for others, investing in its application to a particular sector or related sectors is often more fruitful"* (COM(2010) 553, page 7[23]). In this initial approach, the emphasis is on regional resources combined with related analytical knowledge. In later formulations the emphasis on R&D is qualified "…embracing a broader concept of innovation, not only investment in research or the manufacturing sector, but also building regional competitiveness through design and creative industries, social and service innovation, new business models and practice-based innovation"(Foray et al., 2012, p7[24]).

[22] Foray, D./David, P.A./Hall, B.H. (2009): Smart Specialisation – The Concept. Knowledge Economists Policy Brief, 9 (= Policy brief delivered by the "Knowledge for Growth" Expert Group advising the Commissioner for Research, Janez Potoènik). Online: http://ec.europa.eu/invest-in-research/monitoring/knowledge_en.htm (accessed: 28.02.2011).

[23] https://ec.europa.eu/regional_policy/sources/docoffic/official/communic/smart_growth/comm2010_553_en.pdf COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS: Regional Policy contributing to smart growth in Europe 2020.

[24] Foray, D., Goddard, J., Beldarrain, X. G., Landabaso, M., McCann, P., Morgan, K., Nauwelaers, C., Ortega Argilés, R. and Mulatero, F. (2012) Guide to Research and Innovation Strategies for Smart Specialisations (RIS 3).

[25] Kavonius, Veijo (2013). Cross border regional innovation policies. Centre of Expertise Programme – the Finnish Experience of Smart Specialisation: • Original Concept in 1994 – 2006 (science parks as RTOs).

2.2.2 Programme of Centres of Expertise (OSKE)

In the background of the BRIDGES project, and anterior to the concept of Constructing regional advantage based also on knowledge – diffusion approaches was also experience with the Finnish programme of Centres of Expertise (OSKE programme, 1994-2013), an approach towards regional and national innovation systems very close to the RIS3 approach, and which, finally, did not bring about the change it aimed at achieving towards a more equitable but differentiated national innovation system through regional centres of expertise and comparable diffusion of innovation.

The OSKE programme was organised into two periods, the first one (1994-2006) focusing on constructing regional centres for innovations and the second one (2007-2013) focusing on constructing national clusters and internationalisation[25],[26]. The final effectiveness of the programme faced certain challenges (Pirjo Kutinlahti et al[27]) which were confirmed in regional contexts again and again within and beyond the OSKE policy framework. They include critical mass, connectivity, networking issues – all of them strategically addressed by the RIS3 approach.

[26] Pirjo Kutinlahti, Juha Miettinen, Mervi Pitkänen, (2013). Balancing local cluster development needs and a national innovation agenda in Centre of Expertise Program. Workshop 6 - Lessons from the Finnish Cluster Policy. " Finnish cluster policy in 1990's and 2000's Evolution of Centre of Expertise Programme: Local centre stage (1994-2006): – A joint effort by Finnish Government and Regions promote regional development and specialisation in R&D; – Aims to direct local, regional aand national resources towards the development of selected internationally competitive areas of expertise; – The guiding principle in implementation: • regions compete to be included to programme and for funding. National cluster stage (2007-2013): Supports the competitiveness of nationally significant Competence Clusters by pooling together the regionally scattered resources; Strengthens national strongholds and fertilizes cross-sector, cross-disciplinary interaction; Concentrates on the development of internationally top-level Centres of Expertise; Bigger programme entities; Closer link to national innovation policy; More emphasis on national objectives when selecting the Competence Clusters".

Another important challenge, already acknowledged in 2003 (Kaisa Lähteenmäki-Smith 2003[28]), was the inward–bound project criteria that did not really encourage developing national and beyond cooperation networks: "The Finnish Centres of Expertise programme has already been acknowledged as a successful instrument providing further support for innovation activity and regional industrial development, ... One of the main challenges here lies in promoting inter-regional linkages and networks in an environment that is prone to regionally specific co-operative solutions. .... It is thus argued here that organisational learning can be used as a useful tool in understanding these processes" (Lähteenmäki-Smith, Kaisa 2003[29], from the Abstract of the paper). Once again, the RIS3 approach combined with updated values of the Structural Funds towards more permanent and operative interregional partnerships[30] appear to provide, potentially, convincing answers to the challenges of previous programmes and periods: It implies building long term forms of cooperation between and among regions as a regional policy option: "Taken together, the combination of the embeddedness and relatedness principles in economic geography translate the aspatial smart specialisation idea of a relevant size domain into a realistic set of regional policy priorities" (McCann 2011, page 17[31]).

The Finnish Centres of Expertise programme has already been acknowledged as a successful instrument providing further support for innovation activity and regional industrial development.

The BRIDGES project integrated a key conclusion from the preceding discussion: for policies to be successfully implemented, strategic, operational and tactical parametres need to be equally comprehensively and effectively addressed; strategy, no matter how relevant & well designed, strategy does not replace operational and tactical aspects and vice versa. As Arnault Morisson, Thematic Expert in Research and Innovation at the Interreg Europe Policy Learning Platform expressed it "Constructing regional advantage requires regions to design and implement place-based innovation policies that are the most adapted to their institutional contexts. Evolutionary economic policies must also aim to break existing path-dependency and lock-in situations. Interregional learning and exchanges such as the ones taking place in BRIDGES offer a path to design the most adapted and ambitious place-based innovation policies."

[27] Pirjo Kutinlahti, Juha Miettinen, Mervi Pitkänen, (2013). Balancing local cluster development needs and a national innovation agenda in Centre of Expertise Program. Workshop 6 - Lessons from the Finnish Cluster Policy, " Finnish cluster policy in 1990's and 2000's Evolution of Centre of Expertise Programme: Challenges identified during the 2007-2013 programme: European and world wide R&D -networks (FP/NoE, ETP, KIC); Increase of public R&D funding at national and European level; At regional level: more efficient utilisation of ERDF and ESF for competitiveness; Emerging new business on interface of different CoE's and industries; Increasing critical mass of competencies; Internationally attractive innovation environments are created locally; Shortage of skilled labour and growth companies; Regional CoEs more closely connected to national innovation policy".

[28] Lähteenmäki-Smith, Kaisa (2003). Innovation through programming? The Finnish centres of expertise programme as an instrument of networking... . Paper to be presented at the DRUID Summer Conference 2003 on CREATING, SHARING AND TRANSFERRING KNOWLEDGE. The role of Geography, Institutions and Organizations. Copenhagen June 12-14, 2003. Theme E Networks, Projects and New Organisational forms as Vehicles for Knowledge Building and Transfer. https://www.researchgate.net/publication/228867861.

[29] Lähteenmäki-Smith, Kaisa (2003). Innovation through programming? The Finnish centres of expertise programme as an instrument of networking... . Paper to be presented at the DRUID Summer Conference 2003 on CREATING, SHARING AND TRANSFERRING KNOWLEDGE. The role of Geography, Institutions and Organizations. Copenhagen June 12-14, 2003. Theme E Networks, Projects and New Organisational forms as Vehicles for Knowledge Building and Transfer. https://www.researchgate.net/publication/228867861.

[30] The European Commission made RIS3 a pre-condition for ERDF funding. EU Members States and regions must have RIS3 strategies in place before their Operational Programmes supporting these investments are approved. NATIONAL/REGIONAL INNOVATION STRATEGIES FOR SMART SPECIALISATION (RIS3), COHESION POLICY 2014-2020 http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/smart_specialisation_en.pdf.

[31] McCann, P. and Ortega-Argilés, R. (2011). Smart Specialisation, Regional Growth and Applications to EU Cohesion Policy.

2.2.3 Research and Technology Organisations

RTOs are non-profit organisations with public missions to support society. To do so, they cooperate with industries, large and small, as well as a wide array of public actors. RTOs' technologies cover all scientific fields. Their work ranges from basic research to new products and services development. In Europe, RTO network counts over 350 RTOs in more than 20 countries and represents 150.000 highly-skilled researchers and engineers managing a wide range of innovation infrastructures, piloting environments and testbeds[32].

RTOs provide a backbone of testbeds and often also operate testbeds for other actors, e.g. regional or public organisations. Testbeds are innovation infrastructure where new products, processes and services can be developed and tested under real conditions or close to real conditions. Such testbeds can include laboratory set up, development environment and testbeds In Real Life (IRL). They focus on innovation. RTOs provide not only the physical facility and test environment, but also technical and scientific expertise, and often act as nodes in networks together with other actors such as universities and companies within the research and innovation ecosystem. Such testbeds, or innovation infrastructures provide clients with independent, confidential services and with experience to work with a broad range of stakeholders, from academic institutions to small companies.

Research and Technology Oganisations (RTOs) take an important position in transforming new research and technologies into use in industry and society.

Access to industrial ecosystems for research and innovation are becoming crucial for companies to grow and develop their future competitive portfolio of product and services. The availability of state-of-the-art testbeds/ industrial ecosystems for R&I are also becoming ever more important in attracting talent and foreign investments. Regarding testbeds and demonstration environments involving different types of infrastructure, the need for critical mass and high usage is outspoken. In particular, input factors such as research funding play an important role. The strategic importance of technology infrastructures has been recognised by the European Union as well[33].

[32] https://www.earto.eu/

[33] See for example: https://ec.europa.eu/info/publications/technology-infrastructures_en; also: Directorate-General for Research and Innovation (European Commission) (2019). Technology infrastructures. Commission Staff Working Document. DOI 10.2777/83750.

https://op.europa.eu/en/publication-detail/-/publication/0df85f8b-7b72-11e9-9f05-01aa75ed71a1/language-en

https://ec.europa.eu/commission/presscorner/detail/en/IP_19_6204

https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs

https://www.interregeurope.eu/fileadmin/user_upload/plp_uploads/policy_briefs/TO1_policy_brief_Research_and_innovation_infrastructure.pdf

[34] Martin, R. (2013). "Differentiated Knowledge Bases and the Nature of Innovation Networks," Papers in Innovation Studies 2013/14, Lund University, CIRCLE-Center for Innovation, Research and Competences in the Learning Economy. In this paper it is argued that "the nature of innovation networks can vary substantially with regard to the type of knowledge that is critical for innovation. ... The findings suggest that networks in analytical industries are not much constrained by geographical distance; knowledge is exchanged in a highly selective manner between research units and scientists in globally configured epistemic communities. Synthetic industries source knowledge within nationally or regionally configured networks between suppliers and customers, and within communities of practice. Symbolic industries rely on knowledge that is culturally defined and highly context specific, resulting in localized networks that are temporary and flexible in nature."

[35] Smith, K. (2002). What is the 'Knowledge Economy'? Knowledge Intensity and Distributed Knowledge Bases: The United Nations University, Discussion Paper Series #2002-6. Page 18 " The aim is to generate a more nuanced understanding of the meaning of 'knowledge intensity' in production. The approach rests on what the paper terms 'distributed knowledge bases' that have a systemic and institutionally diffuse location. Knowledge for many key activities is distributed among agents, institutions and knowledge fields, and the problem is to understand the embodied and disembodied knowledge flows between them."

2.2.4 Knowledge bases, knowledge spillovers and proximities

The BRIDGES project is aligned with the initial R&D approach, emphasising access to analytical knowledge[34],[35],[36] and considering the RTOs and CCs as the competent diffusers of analytical knowledge through synthetic knowledge applications. This preference is partially explained by the RIS3 industrial & knowledge bases (bio-based technologies) of the partner regions, but it was also an expressed priority of the partner regions, i.e. regardless of the RIS3 industries. Advanced analytical knowledge might or might not be available locally (especially in the case of less advanced regions); on the contrary, innovation infrastructures, serving the purpose of effective, specialised knowledge flows, were assumed to a requirement of any location that has RIS3 implementation ambitions. Research on constructed regional advantage and on distributed knowledge bases have evolved into mutually reinforcing approaches articulated through platform policies[37].

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[36] Asheim, B.T., Coenen, L., Moodysson, J., Vang, Jan (2005). Regional Innovation System Policy: a Knowledge-based approach. Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE) Lund University. Paper no. 2005/13. **Analytic knowledge**= innovation by creation of new knowledge; importance of scientific knowledge often based on deductive processes and formal models. **Synthetic knowledge**= Innovation by application or novel combination of existing knowledge; importance of applied, problem related knowledge (engineering) often through inductive processes, importance of reusing or challenging existing conventions. **Symbolic knowledge**= innovation by recombination of existing knowledge in new ways; Importance of reusing or challenging existing conventions.

Bjørn Asheim, Markus Grillitsch & Michaela Trippl (2017) Introduction: Combinatorial Knowledge Bases, Regional Innovation, and Development Dynamics, Economic Geography, 93:5, 429-435, DOI: 10.1080/00130095.2017.1380775. To link to this article: https://doi.org/10.1080/00130095.2017.1380775. Page 2: "The knowledge base approach goes beyond sector and regional approaches to innovation and focuses on micro-level dynamics of knowledge creation and knowledge combination within firms, industries and regions".

Bjørn Asheim (2007) DIFFERENTIATED KNOWLEDGE BASES AND VARIETIES OF REGIONAL INNOVATION SYSTEMS, Innovation: The European Journal of Social Science Research, 20:3, 223-241, DOI: 10.1080/13511610701722846.

Markus Grillitsch, Bjørn Asheim. (2018) Place-based innovation policy for industrial diversification in regions. European Planning Studies 26:8, pages 1638-1662.

Table 1, below, reminds of the distributed knowledge base concept introduced by Asheim in 2005[38] already. The BRIDGES project benefits from this approach especially addressing analytical and synthetic knowledge, Table 1 cells in blue fonts. In these cells the text in italics indicates the relationship of the different types of knowledge to the BRIDGES project. One important finding from the project was confirming the importance of analytical knowledge inputs to the RIS3, implying i.a. that regions need to either co-locate with analytical knowledge units or secure strategic and operational access to them. The latter solution could be part of a regionalised innovation system. Synthetic knowledge, on the other hand, appeared necessary part of the localised innovation system.

Table 1 Distributed knowledge base and the BRIDGES project[39]

Analytical *In the BRIDGES project: Part of the regionalised innovation system*	Synthetic *In the BRIDGES project: Part of the localised innovation system*	Symbolic
Production of analytical knowledge can be missing in less advanced regions	Innovation infrastructures make the necessary specialised knowledge flows, upstream and downstream.	
Innovation by creation of new knowledge.	Innovation by application or novel combination of existing knowledge	Innovation by recombination of existing knowledge in new ways.
Importance of scientific knowledge often based on deductive processes and formal models	Importance of applied, problem related knowledge (engineering) often through inductive processes. Importance of linking problematising to the demand – led approach. Importance of reusing or challenging existing conventions	Importance of reusing or challenging existing conventions

Analytical *In the BRIDGES project: Part of the regionalised innovation system*	Synthetic *In the BRIDGES project: Part of the localised innovation system*	Symbolic
Research collaboration between firms (R&D department) and research organisations	Interactive learning with clients and suppliers	Learning through interaction in the professional community, learning from youth/street culture or 'fine' culture and interaction with 'border' professional communities.
Dominance of codified knowledge due to documentation	Dominance of tacit knowledge due to more to concrete know how	Reliance on tacit knowledge, craft and practical skills and search skills
More radical innovation	Mainly incremental innovation	Occasional radical product innovations, mainly smaller re- combinations of existing.

[37] Asheim, B.T., & Boschma, R.A. & Philip Cooke, 2007. "Constructing regional advantage: Platform policies based on related variety and differentiated knowledge bases," Papers in Evolutionary Economic Geography (PEEG) Papers in Evolutionary Economic Geography (PEEG) 0709, Utrecht University, Department of Human Geography and Spatial Planning, Group Economic Geography, revised Nov 2007.

Bjørn T. Asheim, B.T., (2013) Business Strategy, Learning Regions and Knowledge Bases: Lecture, Universitat Politecnica, Valencia, 22nd November 2013, slide 4: "Firms and regions compete on the basis of unique products and services; Uniqueness is created through product differentiation; Product differentiation can be achieved in all types of economic activities but in different ways dependent on the dominant knowledge bases; Competitiveness is based on continuous innovation – innovation represents the high road strategy of competition; Competitiveness is both path extension and new path development (path renewal and path creation); Firms do not innovate in isolation but in interaction with other firms and organisations (universities). Firms need to be part of and get support from clusters and regional innovation systems".

[38] Asheim, B.T., Coenen, L., Moodysson, J., Vang, Jan (2005). Regional Innovation System Policy: a Knowledge-based approach. Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE) Lund University. Paper no. 2005/13.

[39] Source: Table 1 is adapted from Figure 1, page 9 of the Asheim et al 2005 article.

It puts emphasis on two conditions for the overall feasibility of the effort: institutional proximity in the sense of giving preference to Structural Funds Managing Authorities (MA) or Intermediate Bodies (IB) as partners, and cognitive proximity as a proxy for the RIS3 bio-based economy reference. The rational for giving priority to cognitive proximity (rather than other possible types), is the assumption that a comparable level of RIS3 & bio-based economy knowledge are shared across the partnership, as a precondition for planning and implementing the RIS3 in the first place.

The project argument is that combination of coherent institutional and cognitive proximities would lead to organisational proximity between & among project regions, i.e. to permanent or at least non project-bound types of interregional connectivity. This would be evidenced by relevant policy provisions improvements[40]. Research shows evidence of scientific spillovers (such as know-how and technology transfers) across regions; however, this is linked to a spatial decay effect (Acosta & Coronado, 2004, page 10). In the case of the BRIDGES project, it was hoped -also as part of the Interreg Europe programme objectives- that the voluntarism of the MAs/IBs would counteract the spatial decay effect. This is not an unreasonable expectation since "even though higher research expenditure or increased resources are known to generate improved science-technology flows, we should not forget that, if these are not complemented with an integral regional planning of R&D that includes the other elements of the system of innovation and their interrelationships, and an effective coordination with the national and European planning, then the regional paradox (regions that are achieving high levels of research excellence present some very poor results in the field of innovation and the technological development of their companies), ... will not be resolved." (Acosta & Coronado, 2004, page 17). The project experience confirms the preceding statement. What the project process revealed is that usually it was MAs and IBs that were able to implement action plans to the end, while regional development institutions faced more challenges. These insights are summarised in Table 2.

Finally, the project refers to knowledge spillovers and proximity theories as tools supporting the good practice transfer and establishment of interregional linkages among and between the partner regions.

[40] Lalrindiki, M. and Prof. Bill O'Gorman (2011). Proximity and Inter-regional Innovation Systems: A look into Institutional Proximity. Centre for Enterprise Development & Regional Economy (CEDRE) Waterford Institute of Technology. Pages 2-3: "Fitjar et al (2015) refer to organisational proximity as the extent to which the external partnerships are organised through formal arrangements. This is based on the idea of degree of control of organisational relations, which can range from 'on the spot' market to formal arrangements of different degrees. Organisational proximity is often seen to reduce uncertainty and opportunism, which is beneficial for developing innovation networks (Boschma and Frenken, 2010)".

Fitjar, R. D., Huber, F., and Rodríguez-pose, A. (2015) Not too close, not too far. Towards an Empirical Test of the Goldilocks Principle of Non-Geographical Distance in Collaboration Networks for Innovation. Paper presented at DRUID 2015 conference.

Boschma, R., and Frenken, K. (2010) The spatial evolution of innovation networks. A proximity perspective. The handbook of evolutionary economic geography, 120-135.

Boschma, R. (2005) Proximity and innovation: a critical assessment. Regional studies, 39(1), 61-74.

Gallaud, D., and Torre, A. (2005) Geographical proximity and the diffusion of knowledge. InRethinking Regional Innovation and Change (pp. 127-146). Springer New York.

Balland, P. A. (2012) Proximity and the evolution of collaboration networks: evidence from research and development projects within the global navigation satellite system (GNSS) industry.Regional Studies, 46(6), 741-756.

Torre A., Gilly J.P., 1999, On the analytical dimension of Proximity Dynamics, Regional Studies, vol. 34, n°2, 169-180.

Carrincazeaux, Ch., Lung, Y. & Vicente, J. (2008) The Scientific Trajectory of the French School of Proximity: Interaction- and Institution-based Approaches to Regional Innovation Systems, European Planning Studies, 16:5, 617-628, DOI: 10.1080/09654310802049117.

Balland, Pierre-Alexandre, Boschma, Ron & Frenken,Koen (2015). Proximity and Innovation: From Statics to Dynamics,Regional Studies, 49:6, 907-920, DOI: 10.1080/00343404.2014.883598.

Andre Torre & Alain Rallet (2005). Proximity and Localization, Regional Studies, 39:1, 47-59, DOI: 10.1080/0034340052000320842.

Van Oort, Frank & Ponds, Roderick, & Frenken, Koen, 2006. "The Geographical and Institutional Proximity of Scientific Collaboration Networks," ERSA conference papers ersa06p762, European Regional Science Association. From the Abstract: "On the network-level we conclude on differences in the fields of life- and physical sciences and on differences on the type of relations according to university-firm, university-university and university-governmental institution linkages. On the regional level we conclude on the centrality and spatial extent of scientific collaboration hubs over time".

Table 2 Action plan status, focus and types of partner institutions indicating linkages with MAs/IBs

Action plan (AP) status	Action plan focus and types of partner institutions indicating linkages to the MA/IB	
	Project based on calls of Regional Operational Programmes	**Permanent connectivity schemes**
Formulated, endorsed, not supported sufficiently	1 action plan Institution: Regional development company; owned by regional actors	
Formulated and endorsed, implemented with delay	1 action plan Institution: Regional development company; owned by the Regional Government	TO1 calls (research to business, research to industry, research to regional innovation systems)
Action plan formulated, endorsed & implemented, including policy impact	4 action plans Institutions: 3 regional development companies, 1 Managing Authority (MA) and 2 Intermediate Bodies (IB); 1 RDC &1 IB in the same region, i.e. joint AP; 1 regional development company hosts LLD decision making.	2 action plans Institutions: two IBs Action plan reinforced through the pilot action

2.3 Research questions

The research questions relate to the impact of the project objectives distinguished into five (5) questions:

Research question 1: Is it possible to construct regional advantage (CRA) by exploring research-to-business interregional level benefits? What would be the CRA concept and what would it imply for regional policies (RIS3 in this case)?

Research question 2: What is the role of RTOs in the process of constructing regional advantage, benefitting from regional and / or transregional options?

Research question 3: Can less advanced regions[41] benefit from the potential of their research units towards internationalised commercialisation of their research results?

Research question 4: Are win-win, research-to-business partnerships between advanced and less advanced regions possible, and what could be their base?

Research question 5: Do institutional and economic base proximities lead to successful interregional cooperation schemes?

[41] "Advanced regions": leading innovators according to European Innovation Scoreboard (EIS) 2019. In the BRIDGES project there is one innovation leader, PP4 (Helsinki-Uusimaa). "Less advanced regions": all others, i.e. non-innovation leaders, according to the EIS 2019.

[42] Foray, D., Goddard, J., Beldarrain, X. G., Landabaso, M., McCann, P., Morgan, K., Nauwelaers, C., Ortega Argilés, R. and Mulatero, F. (2012) Guide to Research and Innovation Strategies for Smart Specialisations (RIS3).

[43] Boschma, R. A. (2017). Regional diversification, relatedness and smart specialisation", DGRegio – ERSA 2017.

[44] Thissen, M., Diodato, D., van Oort, F. (2013). Integration and Convergence in Regional Europe: European Regional Trade Flows from 2000 to 2010. ("From this data set, we derived that European regions are subject to increases in internationalisation and integration"). https://www.researchgate.net/publication/251573028

Table 3 BRIDGES project research questions positioning

Conceptual background	The research questions in relation to the project focus and the conceptual background
RIS3	**Project focus**: RIS3 bio-based industries (shared economic base reference for the partner regions). Innovation system state of play (innovation maps). Addressing mismatches between economic and research bases through interregional solutions and technological connectivity. **Relevant aspects of the conceptual background:** Prioritised activities, technologies or sectors where a region has the most realistic chances to develop wide-ranging and large-scale impacts which also develop and build on many different local and interregional linkages and connections. (Foray et al. 2012[42]) Policy to prioritise choices "based on a region's competences and capabilities"; smart specialisation to promote innovation and entrepreneurship via technological diversification; embeddedness, connectivity" (Boschma 2017)[43]. Increasing the outward orientation and global engagement (Thissen et al. 2013[44]). **Research question:** Research questions 1, 3, 4.
Constructed regional advantage	**Project focus:** Constructing regional advantage rather than "just" exploiting competitive advantage. Creating and stabilising new competitive advantage, breaking away from lock ins dictated by historical technological trajectories. Assessing the potential of regional innovation systems through external observers' '2nd readings'. Regionalisation vs localisation of innovation policy. **Relevant aspects of the conceptual background:** Exploring institutional and economic complementarities in knowledge economies. Devising ways to valorise specific knowledge-assets at regional level …[is]… a crucial task and allows regions to achieve "constructed regional advantage". Developing the endogenous capacity of the region to innovate, capitalising on their strengths to create wealth and jobs. Applying public policy to achieve improved or new regional endowments, by exploiting the resources and capabilities of a regional innovation system, rather than addressing only interactions among localised actors. The regionalisation of innovation policy holds the potential for improved 'on-the-ground' policy by developing know-how about specific economy conditions at the regional action level (Cook et al. 2006)[45]."The question is how a nation provides an environment in which its firms are able to improve and innovate faster than foreign rivals in a particular industry" (Porter 1990, p.20)[46]. **Research question:** Research questions 1, 3, 4.

Conceptual background	The research questions in relation to the project focus and the conceptual background
Programme of Centres of Expertise (OSKE)	**Project focus**: For policies to be successfully implemented, strategic, operational and tactical parametres need to be equally comprehensively and effectively addressed; strategy, no matter how relevant & well designed, strategy does not replace operational and tactical aspects and vice versa. **Relevant aspects of the conceptual background:** Based on regional specialisations and knowledge – diffusion approaches, the Finnish programme of Centres of Expertise (OSKE programme, 1994-2013), was an approach towards regional and national innovation systems very close to the RIS3 approach. **Research question:** Research questions 1, 3, 4.
Research and Technology Organisations	**Project focus:** Innovation infrastructures as specialised knowledge-flows "distributors" and networking agents within the region and across regions. **Relevant aspects of the conceptual background:** Technology transfer centres in relevant sectors[47] & Research & technology organisations (RTOs) as part of the regionalised research and innovation system. **Research question:** Research question 2
Knowledge bases, knowledge spillovers and proximities	**Project focus:** Mismatches between research and knowledge bases; good practice transfer; economic, institutional, relational and knowledge proximities. **Relevant aspects of the conceptual background:** Classification of types of knowledge as a way to better understand better regional RIS3 knowledge capacities and possibly indicated types of connectivity; institutional and knowledge proximities as a proxy measuring the possibilities of good practice transfer. **Research question:** Research question 5.

[45] EUROPEAN COMMISSION (Prof. Phil COOKE (Rapporteur) with Prof. Bjørn ASHEIM, Prof. Jan ANNERSTEDT, Dr Jiří BLAŽEK, Prof. Ron BOSCHMA, Prof. Daneš BRZICA, Prof. Asa DAHLSTRAND LINDHOLM, Mr. Jaime DEL CASTILLO HERMOSA, Prof. Philippe LAREDO, Ms Marina MOULA, Prof. Andrea PICCALUGA (2006). CONSTRUCTING REGIONAL ADVANTAGE – FULL REPORT principles – perspectives – policies.

[46] Porter, M. (1990). The Competitive Advantage of Nations, https://hbr.org/1990/03/the-competitive-advantage-of-nations.

[47] OECD (2011), Regions and Innovation Policy, OECD Reviews of Regional Innovation, OECD Publishing, Paris. https://doi.org/10.1787/9789264097803-en.

3.

Project documentation

The BRIDGES project's inspiration was initiated in December 2014. However, the discussion had started earlier, when three of the partners were already discussing RIS3 implementation.

They were experiencing 'gaps' that needed to be bridged for RIS3 to have multiplier effect.

Low upscale investments & impact on growth and jobs were brought forward. Further, mismatches between RIS3 productive & research, development and innovation (RDI) bases, distance from & better exploitation of research excellence, and restricted resources towards RIS3 impact, resulted in economy renewal slow down, with considerable research remaining unexplored & underexploited, & minimal benefits from entrepreneurial discovery of knowledge intensive, emerging industries. The decision to focus on innovation infrastructures such as innovation agencies was motivated by experience: to unlock the RIS3 potential, regional innovation agencies, should align their services better with RIS3, focusing on demand-led innovation opportunities and their valorisation through research-to-industry partnerships. Regional authorities should encourage the ecosystem approach, and where triple helices indicated imperfect regional innovation systems and gaps they were expected to be prepared to openly adopt interregional tools.

The policy learning was planned to address systematically and document the state of play of these issues in each one of the partner regions, exchange on good practices, and safely lead to the action plans. In this section are discussed the project outputs that formed the knowledge and later the action plans base of the operation. They include the **Policy review** that took place during the first semester of the project (spring 2016), the **Regional innovation maps**, the **Good practice exchange** and the regional **Action plans.**

The decision to focus on innovation infrastructures such as innovation agencies was motivated by experience.

3.1 Policy review

RIS3 strategies and priorities are part of regional development continua, regional contexts evolving with time forming evolutionary patterns. These patterns maybe precede absorptive capacity issues, while they are not always taken into account by regional policies.

At the end of the 1st semester of the project operation (30.9.2016) one of the first project outputs was a policy review exercise. It was meant to be a self-reflection of the partner regions in relation to their productive and innovation systems, as part of their reported RIS3 bio-based industry priorities. The project exchange revealed clear sectorial priorities across the partnership, and, for the most part, also industrial priorities. The regional innovation system in many cases[48] did not reveal coherence and / or knowledge flows, while at the same time a good knowledge base was available. Important performance and knowledge gaps were revealed between regional growth-drivers and smaller players. Expectations from the interregional cooperation, in four out of six cases were about scaled up diversification. In two cases, expectations were more about reinforcing strengths[49] and healing innovation system gaps through scaled up specialisation & improvements of the innovation system knowledge flows[50].

[48] Except in the case of the innovation-advanced region.

[49] The innovation-advanced region

[50] One of the less innovation-advanced regions.

3.2 Regional innovation maps

The purpose of the innovation maps was to collect evidence regarding the potential & the needs and for interregional technological connectivity options focusing on research & innovation infrastructure units with businesses. The innovation maps were expected to bring together the most performing parts of the partner regions' economic base with technological connectivity needs as well as describe the partner regions' mismatches between their economic & knowledge bases and challenges of associated knowledge flows. This information was meant to form the evidence base for the good practice exchange.

Mapping research & innovation infrastructure units was a straightforward issue. However, identifying the most relevant businesses as well as knowledge flows between research and business, was much more demanding. Finally the following set of criteria were agreed:

- Bio-economy businesses that have received public support (as appliers or part of a partnership) for innovative products development and which have invested for the product development during the last 3 years. (Input & performance indicator)
- Bio-economy businesses that have utilised advanced research services (e.g. material research measurements) during the last 3 years; single, short term cooperation. (Output indicator)
- Bio-economy businesses that have been developing products through Research2Business innovation partnerships during the last 3 years; long term, comprehensive cooperation. (Output indicator)
- Bio-economy businesses that have applied for patents (biotechnology) and /or IPR during the last 3 years. (Output indicator)
- Bio-economy businesses that have applied for Phase 1 SME or Phase 2 SME Instrument (TRL 6 and higher). (Performance indicator)
- Mapping research infrastructures specialising in bio-based industries, associated technology transfer offices, and internationalisation interests.

The results of the innovation maps revealed something different than predicted. This made it clear that the number of innovation performing businesses with interregional connectivity potential, was much smaller than initially anticipated; while, on the other hand, a wider range of connectivity options profiled itself. These additional options went beyond research-to-business to also indicate needs or potential for research-to-industry and research–to-regional innovation system collaborations. The additional fields of cooperation potential required an adjustment of the project approach and problematique, to include, in addition to research-to-business, also research-to -industry and -innovation system options. It appeared as an, ideally, nested process, relating to the complexity of the intervention and therefore the impact: product innovation, new product lines, innovation system improvement, Table 4.

Table 4 BRIDGES, regional innovation maps results indicating fields of research inputs

Fields of research inputs	Indicative types of actions as per field of research inputs	Complexity, from output to systemic
Research to business	New product (knowledge and transfer inputs); might include localisation of existing products Might include market placement	+
Research to industry	New product line (-s). Improving & clarifying required factors for new product lines. It includes clarifying types of knowledge inputs needed, new product (-s) (knowledge and transfer inputs); might include localisation of existing products; Might include market placement	++
Research to innovation system	Strengthening the interactions and integration of regional innovation systems; cross cutting or industry-related.	+++

We mapped the tools for addressing the different fields and also analysed what would be the most effective way to address these fields, i.e. where to start and what, ultimately to mainstream through policy impact. Types of actions and funding options as they were available in summer 2017, are indicated and associated to the three different types of interregional cooperation priorities, Table 5.

It was noticed that for research-to-business partnerships there existed interregional piloting tools (like innovation vouchers) and one excellent partnership building tool called ZIM (Central Innovation Tools for SMEs, from Germany, organised at bilateral level with several countries)[51] which includes also options allowing unilateral business involvement, i.e. without requiring business involvement on both sides. ZIM is an acknowledged good practice in the EU and the USA[52]. ZIM functions more at national level, so it might be good to be transferred also to regional level[53]. However, in relation to research-to-industry and research-to-innovation systems, we were able to identify any tools.

[51] ZIM Central Innovation Programme for SMEs, https://www.zim.de/ZIM/Redaktion/DE/Publikationen/Publikationen/informationsbroschuere-zim-englisch.pdf?__blob=publicationFile&v=11.

[52] EUROPEAN COMMISSION, through Pro Inno Europe (Eelco Denekamp) (2013). Eight innovation programmes and their good practices; Deliverable D2.3, Finla report. CIP project index VINNOVA Dno: 2009-04589, Document ID: IPF 12-016. Pages 9-13. Page 9: "The Central Innovation Programme SME (ZIM or Zentrales Innovationsprogramm Mittel- stand in German) is the basic programme of the Federal Ministry of Economics and Technology (BMWi) for market-driven technology support of the innovative SMEs in Germany. The ZIM programme – executed by Euronorm - was launched on 1 July 2008 and runs until the end of 2013. It offers funding for R&D cooperation and networking projects and, since 1 January 2009, through funding of single firm R&D projects, first in Eastern Germany".

Charles W. Wessner and Alan Wm. Wolff, Editors; Committee on Comparative National Innovation Policies: Best Practice for the 21st Century; Board on Science, Technology, and Economic Policy; Policy and Global Affairs; National Research Council (2012). Rising to the Challenge: U.S. Innovation Policy for the Global Economy. Copyright © National Academy of Sciences. All rights reserved. Pages 310-311.

[53] This idea was introduced to the BRIDGES partnership during the 2nd interregional policy learnign session in Burogs, end October 2016, however, it was not greatly encouraged.

Table 5 BRIDGES, research inputs & tools

	Innovation maps findings		
	Research to business	Research-to-industry	Research-to- regional innovation system
Types of actions	1) Joint product development; 2) commercialisation of research; 3) Interregional value chains	1) Comprehensive modernisation programmes (strategic documents); 2) Ad hoc research services to businesses; 3) Programme and projects for KET applications; 4) Introduce systematic 'upstreaming' and 'downstreaming', Annex I CPR 2014-2020; 5) increase TRL, 6) Standardisation, 7) IPR-based branding, ...	1) Centres of competence & RTOs (institutional level); 2) Linking centres of competence and RTOs to businesses (programme/project level); 3) Innovation management chain (service level)
Funding	1) Inter-regional programme level (H2020, EUREKA, Interreg); 2) Inter-regional project level (ZIM, BRIDGES, CENTROPE); 3) national innovation funds with interregional provisions	1) Comprehensive modernisation programmes (strategic documents); 2) Ad hoc research services to businesses; 3) Programme and projects for KET applications; 4) Introduce systematic 'upstreaming' and 'down-streaming', Annex I CPR 2014-2020; 5) increase TRL, 6) Standardisation, 7) IPR-based branding, ...	1) Structural funds; 2) National innovation funds with interregional provisions

Out of the six BRIDGES regions, four focus on industrial modernisation, three on industrial renewal, and three on industrial diversification (some regions indicated more than one priorities), while all six discussed also innovation system needs and improvements. Research-to-business cooperations appeared to be the exception rather than the rule. In addition tools for business-to-business collaborations were not very popular[54].

Deeper understanding of the reasons, potential & conditions for institutionalising & regionalising what was called by the BRIDGES partners 'innovation on demand' was not common. Finally, one region proceeded to test research-to-business options through their Structural Funds. This was a breakthrough. It pathed the way for the BRIDGES pilot action towards longer term, more stable, supported 'innovation on demand' interregional partnerships.

According to the BRIDGES project experience, they lead to a range rather than a unique product-line types of cooperation, including joint development and research-to-research options. Industrial modernisation and renewal were not defined in depth in the patner regions and the process of related entrepreneurial discovery (EDP) was not complete. To formulate the action plans, however, it would be necessary to decide concrete activities, i.e. project initiatives.

Research-to industry types of connectivity reflect industry & related technologies-based knowledge transfers as well as connectivity methodologies.

[54] For example, we reviewed exhaustively the EUREKA initiative: it proved very hard to make the required interregional linkages between actors of the advanced and one of the less advanced regions. The difficulty seemed to be the precondition for bilateral business involvement, wihtout which the research unit could not be involved.

This might require, in the future, adopting the Project Development Lab method (PDL, Boden 2016[55]), and including the required expertise in this process regardless of location (local, national or international), as a way to avoid localised lock-ins, which are common in peripheral areas. For example, such expertise might refer to extensive knowledge of industrial trends, research trends, and / or benchmarking methodologies. We have realised the need for industrial expertise, often missing in lagging areas. In the BRIDGES project there has been effort to address this through the "2nd readings" and the feasibility studies. One of the regions regularly invests in RIS3-related sectorial strategy studies. However, the case is not closed. *Rather, this is a gap in the RIS3 implementation that was identified, and requires to be addressed in forthcoming regional innovation strategy revisions and new programmes.*

In the case of modernisation regions[56], paths to consider might be expanding the economic base of the most performing industries (exports, innovation), support emerging industries with potential for growth, and invest in increasing spin-offs of the relevant research results to both types of industries[57]. Similarly to the case of industrial modernisation or renewal, systematic diversification approaches & tools were not practiced exhaustively.

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[55] Boden, M. (2019). Targeted support to Smart Specialisation in Lagging Regions. The European Commission's science and knowledge service. Joint Research Centre.

https://s3platform.jrc.ec.europa.eu/documents/20182/355850/Mark+Boden+presentation+KAIST.pdf/82aaf315-22e9-4721-99a6-37c748f492dc .

Boden, M. et al (2016). RIS3 support in Lagging Regions Bari, 11 July 2016 Serving society Stimulating innovation Supporting legislation www.jrc.ec.europa.eu Project team: Mark Boden, Karel Haegeman, Elisabetta Marinelli, Patrice dos Santos, Susana Valero.

[56] "Modernisation regions" are regions that need to undergo very significant changes to their economic base, towards extended economy renewal (modernisation). On the other hand, "specialisation regions" are regions that have a good economic performance and through specialisation could aim towards becoming top regions in some industrial segments. Dominique Foray (2013) The economic fundamentals of smart specialisation. Ekonomiaz N.o 83, 2.o cuatrimestre, 2013, p17 proposes a typology to characterise regions in respect to smart specialisation: "In section 1, a typology of structural changes has been suggested (modernisation, diversification, transition, radical foundation). This typology outlines central elements in the policy process. It provides policy makers with the possibility to think ahead and identify the most desirable structural evolution of the regional economy given its strengths and weaknesses. The policy maker can search for the necessary entrepreneurial knowledge and discoveries that will materialise and validate the policy vision".

Research-to-regional innovation systems connectivity needs were about the function of regional triple (and quadruple) helices. There is a nominal triple helix in all the regions, which however, does not always work either because of knowledge mismatches (i.e. the knowledge and productiver bases are not demonstrating effective complementarities), or because the localised triple helix is not functioning, is only partially meaningful, or even because the needed specialisation is missing also from national level. Four out of five regions confirmed these observations, as they are interested to develop industry-led centres of competence with project generation linkages to businesses, i.e. to improve the function of their innovation system adopting regionalised (rather than localised) solutions. Another "gap" in most regions, was the lack of the institutions and functions of innovation management chains. In general, the parametres of critical mass and connectivity, so strong in the RIS3 literature (and with acknowledged challenges[58],[59]), were usually not sufficiently addressed in/by the RIS3.

[57] ANSELIN L. (1988) Spatial Econometrics: methods and models. Kluwer, Dordrecht.

BRESCHI S., LISSONI F. and MALERBA F. (2003) Knowledge-relatedness in firm technological diversification. Research Policy 32, 69-87.

Castaldi, C., Frenken, K., & Los, B.,(2013). Related variety, unrelated variety and technological breakthroughs: an analysis of U.S. state-level patenting. (ECIS working paper series; Vol. 201303). Eindhoven: Technische Universiteit Eindhoven.

DISSART J. C. (2003). Regional economic diversity and regional economic stability: research results and agenda. International Regional Science Review 26, 423-446.

FELDMAN M. P. and AUDRETSCH D. B. (1999). Innovation in cities: Science-based diversity, specialization and localized competition. European Economic Review 43, 409-429.

JACOBS J. (1969). The Economy of Cities. Vintage, New York JACQUEMIN A. P. and BERRY C. H. (1979) Entropy measure of diversification and corporate growth. Journal of Industrial Economics 27, 359-369.

JAFFE A. B. (1986). Technological opportunity and spillovers of R&D. American Economic Review 76, 984-1001.

FRENKEN, K. FRANK VAN OORT and THIJS VERBURG, 2005. Related Variety, Unrelated Variety and Regional Economic Growth, Regional Studies, Vol. 41.5, pp. 685–697, July 2007.

Lindquist, M. (2012). Regional innovation strategies in Sweden; Nordregio 2012.

Brachert, M. Alexander Kubis, Mirko Titze, (2013). Related Variety, Unrelated Variety and Regional Functions: A spatial panel approach; Papers in Evolutionary Economic Geography # 13.01.

Reasons for the reported knowledge and policy gaps were analysed. Findings include: **a)** the RIS3 is like a significant external push to the economy which seeks to upscale itself, while, at the same time, the knowledge base did not have the time (or resources) to do the same; **b)** in some cases, discrepancies between the economic and knowledge bases as a result of, for example, massive industrial delocalisations were possible. In such cases, the knowledge base might be more advanced than the current economic base, serving clients outside the region. Thus, the region was exporting research services while at the same time it was/is in need to import corresponding services for the new industries that are developing. In fact, two of our good practice contributions are related to these phenomena[60]; **c)** we became aware that excellence is currently so fast diversifying, that it is hardly possible for a region to be self sufficient in research services and research infrastructures. We have explored this phenomenon through one of our good practices[61],[62],[63].

The regional innovation maps and the resulting insights were a first milestone in the BRIDGES project operation.

[58] EUROPEAN COMMISSION (2102). Guide to Research and Innovation Strategies for Smart Specialisations (RIS3).

[59] Capello, R. & Henning Kroll, 2016. From theory to practice in smart specialization strategy: emerging limits and possible future trajectories; European Planning Studies, Volume 24, 2016 - Issue 8: Regional Innovation Strategies 3 (RIS3): From Concept to Applications, Pages 1393-1406. http://dx.doi.org/10.1080/09654313.2016.1156058.

[60] KANTOLA and CEMIS, both by PP2

[61] Baltic TRAM project, contributed by PP1.

[62] ZIM, good practice for interregional partnerships for the commercialisation of research, Germany/Finland, contributed by PP1.

[63] Similar considerations are also the focus take up by the Horizon 2020 programme called WIDESPREAD/ TEAMING.

The decision made was that while the initial theme of research-to-business would continue to be addressed, the additional needs & cooperation potential reflected in the regional anayses would be taken into account as well, as additional criteria and expectations in the good practice exchange and the action plans. This decision proved wise: it led to the early cooperation between two partner regions benefitting from research-to-business options, as well as to the reinforcement of the role of innovation infrastructures and RTOs as RIS3 tools. A concept of an interregional connectivities potential & needs space was also introduced: it was the space defined by (the set of all bio-based economy performing businesses as identified through the mapping), intersected by (the set of all relevant research and knwoledge transfer units as identified through the mapping). The 'space concept' is inspired by the contributions of Hausmann and Hidalgo on product space: "Hidalgo et al. (2007) introduce the concept of product space, where each product has a certain proximity to each other product, indicating its relatedness. ... They measure relatedness of products using a proximity indicator based on how often two products co-occur in countries' export portfolios. The idea here holds that if many countries have a comparative advantage both in product A and in product B, apparently A and B are somehow related (sometimes referred to as revealed relatedness following Neffke and Henning 2008)", FIRES 2016, page 12)[64].

[64] We feel it would be worth research more and quantifying such space, especially when it regards interregional potential. For example, potential interregional interaction space (IS), $IS = \sum PP_{i', B} \cup \sum PP_{i', K/R,RTO}$. Potential interregional interaction opportunities field IO was defined as the integral of a function of IS, connectivity types/ tools (CT), i.e. methods, and funding solutions available (FA) $IO = \int f(IS, CT, FA)$.

[65] Interregional partnerships beyond the context of territorial cooperation initiatives, are feasible in various ways. European territorial cooperation programmes, Horison2020, EUREKA partnerships, national innovation programmes with interregional eligibility, and even Article 70 of the 2014-2020 regulation of the structural funds.

[66] REGULATION (EU) No 1303/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2013, page 378.

[67] REGULATION (EU) No 1303/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2013, Annex 1, COORDINATION AND SYNERGIES BETWEEN ESI FUNDS AND OTHER UNION POLICIES AND INSTRUMENTS, 4.3 Horizon 2020 and other centrally managed Union programmes in the areas of research and innovation, page 415.

3.3 Good practice exchange

The good practices (GP) of the BRIDGES project are planning to address three themes:
Industry-led centres of competence as RIS3 innovation infrastructures (GP theme 1), Research-to-business innovation partnerships (GP theme 2) and Multilevel synergies (GP theme 3) including combination of funds and interregional innovation partnerships and joint initiatives beyond the end of the project[65],[66] encouraged as per Annex 1 Coordination and Synergies between ESI funds and other Union policies and instruments[67] due to the emphasis on linking cohesion to innovation actions. RIS3 implementation effectiveness, as, the centre of BRIDGES priorities, might benefit from the provisions described in Annex 1.

They deal with structures and functions of innovation infrastructures, processes & methodologies promoting research-to-business rather than just business-to-research partnerships, and initiatives / solutions to overcome regional (or even simply conjectural) limitations. These considerations have been taken into account also in the formulation of the regional innovation maps. The GP contributions, assessment (by the advisory partners (AP) PP8 CEEI Burgos and PP9 CERTH), analysis (among all the partners) and eventually transfer, are supported by the discussion on the terms of reference of each one of the thematic objectives. During the 1st semester, (9.2.2016 – 30.9.2016) the project partners were working on the conceptual and theoretical background of each GP theme. Partners CEEI Burgos (PP8), Alterra (PP10) – who withdrew in November 2016, and Kainuun Etu (PP1) were taking part in the cooperation procedure to formulate the background material for each GP theme.

The three GP themes have been identified[68] and prioritised by the project partners during the project preparation period as essential to the successful implementation of any regional innovation strategy.

During the good practice collection, it was realised that the project partnership was not going to be able to generate the sufficient number and types of good practices. Therefore the fields were expanded to national and European levels. It is also worth empahsising that good practices identified in other Interreg projects were also beneficial[69]. One of the interesting conclusions of this process is that interregional innovation funding schemes existed and some of them were very strong good practices, such as the ZIM good practice from Germany[70]. However, unfortunately, the impacts of these good practices on regional level are not so high thus we continued looking for proxies to regional level and we managed to identify CENTROPE. This indicated a need, for regions, to link better to national level advanced initiatives and that in this effrot a 'path' was required. This path was later identified and tested through the pilot action[71].

[68] The Global Competitiveness index 2017-2018 IMF, World economic outlook database, April 2017: 1st pillar institutions. 2nd pillar infrastructure, 3rd pillar Macroconomic environment, 4th pillar Health and primary education, 5th pillar Higher education and training, 6th pillar Goods market efficiency, 7th pillar Labour market efficiency, 8th pillar Financial market development, 9th pillar Technological readiness, 10th pillar Market size, 11th pillar Business sophistication, 12th pillar innovation.

[69] Interreg Europe: iEER PGI00111 and UpGradeSME UpGradeSME PGI00115; Central Europe: CENTROPE; and Baltic Sea Region: Science Link & Baltic TRAM.

[70] Federal Ministry of Economics and Technology, Central Innovation Programme (ZIM), January 2011 (http://www.zim-bmwi.de/download/infomaterial/informationsbroschuere-zim-englisch.pdf).

EUROPEAN COMMISSION, through Pro Inno Europe (Eelco Denekamp) (2013). Eight innovation programmes and their good practices; Deliverable D2.3, Finla report. CIP project index VINNOVA Dno: 2009-04589, Document ID: IPF 12-016. Pages 9-13. Page 9: "The Central Innovation Programme SME (ZIM or Zentrales Innovationsprogramm Mittel- stand in German) is the basic programme of the Federal Ministry of Economics and Technology (BMWi) for market-driven technology support of the innovative SMEs in Germany. The ZIM programme – executed by Euronorm - was launched on 1 July 2008 and runs until the end of 2013. It offers funding for R&D cooperation and networking projects and, since 1 January 2009, through funding of single firm R&D projects, first in Eastern Germany.

Charles W. Wessner and Alan Wm. Wolff, Editors; Committee on Comparative National Innovation Policies: Best Practice for the 21st Century; Board on Science, Technology, and Economic Policy; Policy and Global Affairs; National Research Council (2012). Rising to the Challenge: U.S. Innovation Policy for the Global Economy. Copyright © National Academy of Sciences. All rights reserved. Pages 310-311.

Table 6 BRIDGES project good practices, status and results[72]

Title	Status	Results		
		IE base	Project website	Transferred
The Bioeconomy Science Center (BioSC), located in Jülich (Nordrhein-Westfalen)	Published on database	1		1 time
Photonics cluster to create value chains along various economic sectors	Published on database	2		
DIOFARM -PROMIXTURE OF FEED ADDITIVES: R2B & B2B collaboration between Dioscurides and Greek Honey	Published on project website, not inclu-ded in database		1	
Online precise irrigation scheduling / OpIris	Published on database	3		
Improvement of anti-inflammatory & anti-lipid functions of dairy and wine products	Published on database	4		
Helsinki-Uusimaa Regional Council RIS3 coordination	Published on database	5		1 time
Spin-out and entrepreneurial process of Helsinki Innovation Services	Published on database	6		
Voucher for Innovation	Published on database	7		
Innocsekk Plusz 2008 innovation voucher	Published on database	8		
Traceability and Big Data for achieving European AgroFood Sector Smart Specialisation	Published on project website, not included in database		2	1 time
AUTODIAGNOSTIC TOOL FOR AGRO-SMEs	Published on database	9		3 times

Title	Status	Results		
		IE base	Project website	Transferred
Unit of Measurement Technology (MITY) - University of Oulu, as regional specilisation infrastructure	Published on database	10		1 time
Kantola industrial estate and Woodpolis centre of competence	Published on database	11		2 times
European Business and Innovation Centre of Burgos (CEEI-Burgos)	Published on project website, not inclu-ded in database		3	
Slovenian national instrument for centres of excellence and competence centres	Published on database	12		
CENTROPE innovation voucher	Published on database	13		3 times
Large research infrastructure services for SMEs (Science Link & Baltic TRAM projects)	Published on database	14		1 time

[71] Allowing structural funds to link successive initiatives to measurable technology readiness levels improvements in SMEs and providing access to the required research resources regardless of location.

[72] All good practices are accessible at https://www.interregeurope.eu/policylearning/good-practices/item/ + name of good practice name as in Table 3.

Table 6 summarises all the BRIDGES good practices their status as evaluated by the Interreg Europe Policy Learning Platform experts, and how the GPs were valorised by the project partnership based on the transfers. It is indicated that seventeen (17) good practices have been uploaded to the policy learning platform (PLP) and fourteen (14) of them have been approved and integrated into the Interreg Europe programme database, while 3 were not integrated into the IE database but were approved for the project website and location.

1. Essential operations of innovation infrastructures, especially "how" relevant research results are identified, agreed in the region, transferred to businesses and, more widely, to the regional economic base. Such good practice transfers were tested in four regions, with four of them reaching results (new products, all based on interregional cooperation). The conclusion[73] was threefold: (a) the role of RTOs as orchestrators, facilitators and implementers of specialised knowledge flows cannot be overestimated. RTOs should be qualified for this role. It might be worth researching deeper and reinforcing the concept & implementation of 'knowledge as a service' by RTOs; (b) industry-related understanding & the attitudes of regional funders to external knowledge providers & potential cooperators is obviously critical for any types of extended collaborations; and (c) systematic, frequent, and two-way knowledge flows between "(a)" and "(b)" are critical, too.

What can be inferred from the transferred good practices is that the interests of the partners could be defined.

[73] This conclusion is also backed by the findings of the regional innovation maps, whereby, as mentioned under the relevant section " Another "gap" –in most regions, is the lack of the institutions and functions of innovation management chains. Innovation maps and further discussions with the partners showed that the lower the related variety in a region, the higher the need for awareness & understanding of the need for innovation management processes and expertise."

2. On demand schemes and funding towards distributed knowledge/research and economic bases, i.e. interregional innovation vouchers allowing different types of knowledge to be diffused in regions, irrespective of the geographic location of the knowledge resources. Even during Phase 1 of the project three regions developed knowledge tranfser processes: Helsinki-Uusimaa,FI & West Macedonia, GR and Helsinki-Uusimaa, FI & Goriška, SI. The request for having access, options, to innovation 'on demand' funding tools, i.e. options beyond the usual project-based processes, was ubiquitous and repeatedly reported to the Interreg Europe programme.

3. Interactive tools for sharing of information (RIS3 interactive websites).

3.4 Action plans

The action plans were formulated by taking into account all the preceding inputs, i.e. policy review, regional innovation maps, and good practices.

The final action plan contents were further brought in focus through the support of feasibility exercises. This proved a very useful approach because it aimed at systematically tailoring the good practice transfer in the different regional contexts. In the case of one region, this approach, has been institutionalised into policy making approaches (strategic priorities ⟶ sector & industry strategies ⟶ feasibility studies ⟶ evidence -based policy themes and project criteria). In some cases, feasibility study inputs have been introduced also to measure clustering have also been introduced through other Interreg Europe projects[74]. Figure 2 maps the steps in principle included for the formulation of the action plan and the policy impact[75].

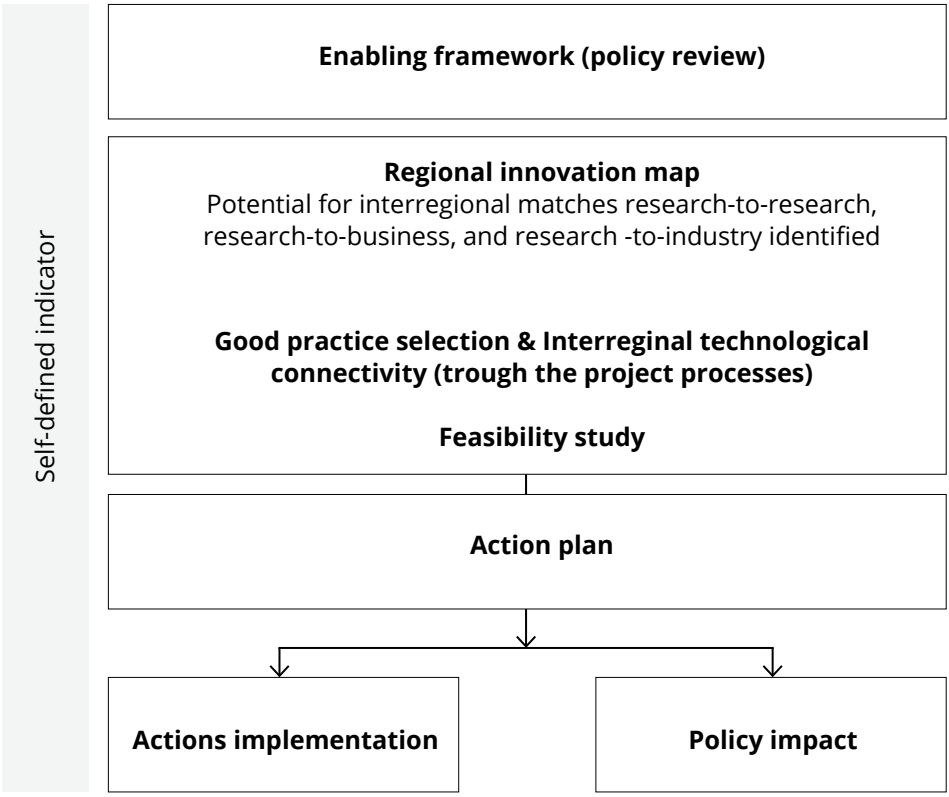
To plan the project actions, including the criteria for identifying good practices, drawing the innovation maps and proposing the action plans, the issues of relatedness, embeddedness, connectivity and critical mass have been explicitly taken into consideration[76].

[74] ecoRIS3 project, feasibility study for the clustering of the mining industry, Kainuu region.

[75] In some cases the realisation of this process was delayed or anyhow hindered by MA/IB hesitations to endorse the action plan, or lack of funds in some cases, or even divergenbt interests on the part of the project partner. Maybe such challenges are inevitable. However, overall, 67% to 84% of the invovled regions benefitted from the project.

[76] McCann, P., & Ortega Argiles, R. (2014). The role of the Smart Specialisation Agenda in a Reformed EU Cohesion Policy: Scienze Regionali: Italian Journal of Regional Science, 13(1), 15-32.

Figure 1 BRIDGES project, the process towards the action plan formulation



In the BRIDGES project, the policy impact can be roughly distinguished into two types (i) as a precondition for the implementation of the action plan (Lubelskie, Goriska, West Macedonia) and (ii) as follow-up, as capitalisation of the action plan implementation (Kainuu and Helsinki-*Uusimaa): the former are reflected on improved / slightly modified ERDF calls including preparatory actions* while the latter *are concentraing on new themes and associated projects related to the RIS3 (Thematic Objective 1 calls).* In the case of the two regions that are modifying the RIS3 thematic fields, the policy improvements cover also permanent transregional linkages and cooperation potential, as this was introduced, tested and evaluated in the framework of the BRIDGES pilot action. These transregional cooperation options build around three themes: research-to-business, research-to-industry and research-to-regional innovation system. The BRIDGES pilot action is integral part of the action plans of the involved partners (Kainuu, Helsinki-Uusimaa and West Macedonia), and access to all action plans is indicated in Table 8 below.

Policy impact, i.e. the policy-based institutionalisation of the learning achieved through the project, can be considered as an ultimate objective of all Interreg Europe projects.

Table 7 The BRIDGES action plans and their focus

Partner region	Action plan
Kainuu, FI	Investment focus: (a) Emerging industries based on lignine processing (circular economy); (b) Commercialisation of research results through internationalisation actions initiatives coordinated by the Intermediate Body; (iii) reinforcing linkages to RTOs. Good practices transferred: (i)The Bioeconomy Science Center (BioSC), located in Jülich (Nordrhein-Westfalen)[77], added value: the concept of developing new industries; (ii) Traceability and Big Data for achieving European AgroFood Sector Smart Specialisation[78]; (iii) CENTROPE innovation voucher[79]. Type of mismatch addressed: (i) research-to-regional innovation system, (ii) research-to-industry, (iii) research-to-business. Access to the action plan summary and key information: Annex 2 Access to the full action plan: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565773671.pdf
Lubelskie, PL	Investment focus: Increase the absorptiveness of the Regional Operational Programme innovation calls by increasing the innovation absorptive capacity of Bio-based SMEs; involvement of RTOs. Good practices transferred: AUTODIAGNOSTIC TOOL FOR AGRO-SMEs[80] Type of mismatch addressed: Research-to-business. Access to the action plan summary and key information: Annex 2 Access to the full action plan: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565778266.pdf

[77]https://www.interregeurope.eu/policylearning/good-practices/item/1648/the-bioeconomy-science-center-biosc-located-in-juelich-nordrhein-westfalen/

[78]https://www.interregeurope.eu/policylearning/good-practices/item/162/traceability-and-big-data-for-achieving-european-agrofood-sector-smart-specialisation/

[79]https://www.interregeurope.eu/policylearning/good-practices/item/11/centrope-innovation-voucher/

[80]https://www.interregeurope.eu/policylearning/good-practices/item/157/auto-diagnostic-tool-for-agro- smes/

Partner region	Action plan
Helsinki – Uusimaa, FI	Investment focus: Increase the commercialisation base of Uusimaa-based research through internationalisation initiatives coordinated by the Intermediate Body; reinforcing linkages to RTOs. Good practices transferred: (i) Large research infrastructure services for SMEs (Science Link & Baltic TRAM projects)[81]; (ii) CENTROPE innovation voucher[82]. Type of mismatch addressed: (i) Research-to-business; (ii) research – to- industry. Access to the action plan summary and key information: Annex 2 Access to the full action plan: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1566302341.pdf
West Macedonia, GR	Investment focus:(i) improving competitiveness, productivity and sustainability of selected agri-food product lines; (ii) improving RIS3 management and goivernance tools; (iii) introducing transregional 'innovation on demand' tools and innovation partnerships as part of the West Macedonia Regional Operational Programme. Good practices transferred: (i)AUTODIAGNOSTIC TOOL[83]; (ii) HURC platform by the PP4 good practice Helsinki-Uusimaa Regional Council RIS3 coordination[84]; (iii) CENTROPE innovation voucher[85]. Type of mismatch addressed: (i) Research-to-business; (ii) research – to- industry; (iii) Other: MA RIS3 management tools. Access to the action plan summary and key information: Annex 2 Access to the full action plan: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565778528.pdf

[81]https://www.interregeurope.eu/policylearning/good-practices/item/8/large-research-infrastructure-services-for-smes-science-link-baltic-tram-projects/

[82]https://www.interregeurope.eu/policylearning/good-practices/item/11/centrope-innovation-voucher/

[83]https://www.interregeurope.eu/policylearning/good-practices/item/157/autodiagnostic-tool-for-agro- smes/

[84]https://www.interregeurope.eu/policylearning/good-practices/item/252/helsinki-uusimaa-regional-council-ris3-coordination/

[85]https://www.interregeurope.eu/policylearning/good-practices/item/11/centrope-innovation-voucher/

Partner region	Action plan
Goriška, SI	Investment focus: To ensure both good state of the ecosystems and development of new products in the sustainable aquaculture industry. Good practices transferred: KANTOLA industrial estate and centre of competence[86]. Type of mismatch addressed: (i) Research-to-business; (ii) Research-to-industry; (iii) Research-to-regional innovation system. Access to the action plan summary and key information: Annex 2 Access to the full action plan: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1564654691.pdf
Western Transdanubia, HU	Investment focus: Digitalisation of the wood processing, furniture industry; establishment of a thematic regional innovation platform. Good practices transferred: (i)AUTODIAGNOSTIC TOOL[87] ; (ii) KANTOLA industrial estate and centre of competence[88]. Type of mismatch addressed: (i) Research-to-business; (il) Research-to-regional innovation system. Access to the action plan summary and key information: Annex 2 Access to the full action plan: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565169704.pdf

[86]https://www.interregeurope.eu/policylearning/good-practices/item/136/kantola-industrial-estate-and-woodpolis-centre-of-competence/

[87]https://www.interregeurope.eu/policylearning/good-practices/item/157/auto-diagnostic-tool-for-agro- smes/

[88]https://www.interregeurope.eu/policylearning/good-practices/item/136/kantola-industrial-estate-and-woodpolis-centre-of-competence/

The mobilisation of resources as a result of the implementation of the action plans is explained in Table 8 below. These amounts are those listed in the approved action plans. The incurred spending will be re-assessed and discussed at the end of Phase 2, during the preparation of the final report of the project, October 2020-March 2021.

Table 8 Mobilisation of resources for the implementation of the action plans[89]

Partner region	Funding sources				
	Project (pilot action)	Structural	National	Own	Total
	127 700	**1 331 263**	**160 000**	**212 500**	**1 831 463**
Kainuu, FI	52 000	105 000	160 000	46 500	363 500
Lubelskie, PL		70 563 (Per implemented case)			70 563
Helsinki – Uusimaa, FI	52 500			81 000	133 500
West Macedonia, GR	23 200	918 000			941 200
Goriška, SI		145 000		85 000	230 000
Western Transdanubia, HU		92 700			92 700

[89] As announced in the approved action plans.

4.

Feedback to the research questions, insights & conclusions

Research question 1: Is it possible to construct regional advantage (CRA) by exploring research-to-business interregional level benefits? What would be the CRA concept and what would it imply for regional policies?

Due to the pilot action and the work carried out together, it is possible to construct regional advantages by exploring research-to-business interregional level benefits. However, some preconditions need to be discussed (questions 2,3,4). The issue is the potential for (a) research-to-business schemes benefitting SMEs, addressing as well at regional level commercialisation of research results through internationalisation and (b) a cumulative result towards associated returns to scale or economies of scope or economies of scale. In the BRIDGES project we found, that in Kainuu one regional research and technology transfer centre is clearly involved in commercialisation of research process, while the other one refuses this option. In Western Macedonia, 3-4 businesses have expressed their interest in the vegetable-based proteins and, in general, in the agri-food sector, therefore this can evolve into a programme-based approach. So, from this perspective, we are proceeding to the policy impact, taking into account these findings through the RIS3 integration.

The essential knowledge transfer issue, in case of RIS3 implementation in less advanced regions, is to break path dependencies that lead to lower productivity and competitiveness lock-ins in the first place. It appears that the knowledge transfer focus should combine scaling up with specialisation[94]. In some cases of less advanced regions like Western Macedonia, due to a very poor productive model in terms of alternatives, the focus has to be also on diversification of their economies. In strong innovator regions, the innovation could focus on diversification[95]. The diversification could be triggered by, for example, new research or research re-use needs

[94] Dominique Foray (2013) The economic fundamentals of smart specialisation. Ekonomiaz N.o 83, 2.o cuatrimestre, 2013.

[95] Ibid., above.

through the cooperation with less advanced regions, based on research-to-industry/business/innovation systems initiatives. This impact could be useful to strong innovators in the sense of providing ever evolving and close to market diversification steps, encouraging them to avoid lock-ins as it was previuosly due to successful paths. (Triple et al 2019, page 9)[96].

It implies different RIS3 orientations for innovation in advanced and less advanced regions; however, it also indicates a concept for an equilibrium whereby win-win cooperations could be explored. This is a possibility maybe deserving to be tested & researched in more depth; it might form a pilot base for longer term interregional institutional cooperations and connectedness forms; the readiness of regions to undertake such initiatives might also be considered[97].

This finding deserves to be researched further, as it links to the quality of the regional innovation governance, including implications for regional development strategies and projects and also poses a challenge to the bottom up approach. For example, it indicates that it would be important for the RIS3 implementation to also include anticipatory, research-to-business rather than strictly business-to-research initiatives or project criteria[98].

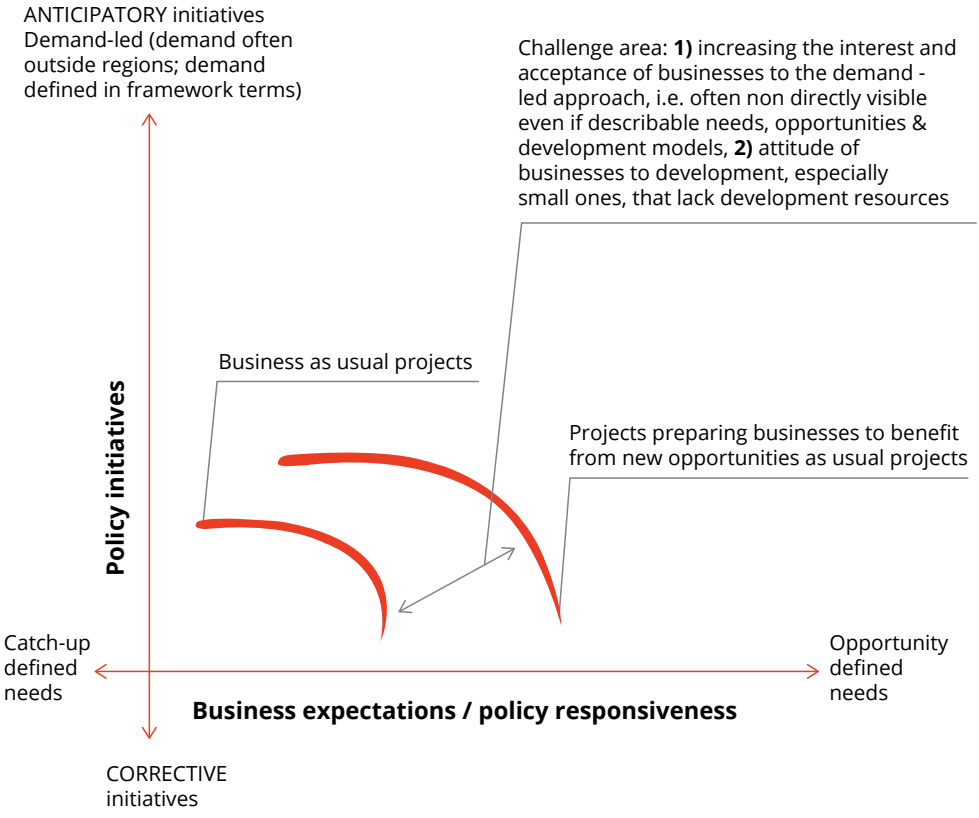
[96]"... the challenge is to find a balance between the inclusive breadth of the areas and focus that would enable the allocation of resources where they can make an impact. A second challenge for these regions is to avoid lock-in into previously successful paths".

[97] The importance of connectedness, and interactions within and between regional innovation systems has been acknowledged e.g. Leydesdorff 2005 (indicator measuring the mutual information between and among the localised, distributed, and globalised triple helix actors, the frequency, depth, quality of the mutual information might ideally function as a plausible tool towards a "perfect" (or at least highly improved) regional innovation system); , Camagni & Capaello 2013, page 6: " The need for connectedness is also stringent in modern times and widely acknowledged; because knowledge has more and more a complex nature, cooperation and networking with selected external competence sources are necessary for the attainment of complementary pieces of knowledge, avoiding lock-in with respect to local historical specialisations".

[98] Research-to-business, in less knowledge intensive contexts, pose what Cook calls 'epistemic boundary challenges' (Cook 2003, page 26): "....difficulties caused in regional innovation systems by epistemic boundaries..." and the requirement that "... the weakest regions must find ways to integrate their traditional assets directly into the Knowledge Economy".

However, this process introduces absorptive innovation capacity requirements and regions need to prepare for them. We called this additional requirement 'the steep learning curve' for less innovation advanced regions. The steep learning curve concept, mapped in Figure 1, and which regional policy makers would need to take this into account into regional strategies including and beyond RIS3.

Figure 2 The steep learning curve in the BRIDGES project



GOAL
PLAN
ACTION

Research question 2: What is the role of RTOs in the process of constructing regional advantage, benefitting from regional or transregional options?

Concering the role of RTOs in the process of constructing regional advantage, BRIDGES was inspired by innovation infrastructures which can be industry-led centres of competence and really large research and technology transfer organisations. Large RTOs such as the VTT in Finland - are mission-driven organisations with a public service mandate “research as a service”. As discussed earlier, there often seems to be a confusion in respect to this role of RTOs as many readers might not understand the distinction between RTOs and universities. On the other hand, institutionalising ‘research as a service’ appears to be a significant part for the effectiveness of any innovation system.

National innovation programmes have sometimes underestimated the importance of innovation infrastructures by limiting policies to costs reduction. Thus, in Slovenia, Centres of Competence that were introduced during the previous period of the Structural Funds, were closed during the present period.

What we have found through the BRIDGES project is that in the innovation infrastructures we can distinguish between the tangible infrastructures, the legal profiles and the operational profiles for specialised knowledge flows.

And yet, the need for the specialised knowledge flows function was strongly confirmed during the BRIDGES project and the action plan adopted and implemented by the partner (Soča Valley Development Centre). It is also indicative that two of the partners (Soča Valley Development Centre and the Pannon Business Network) adopted a good practice from Finland (Kantola) which exactly emphasises the role of specialised knowledge flows. It cannot be expected to have large RTOs established in each and every region.

However, regional and national policy makers can foresee comparable principles of operation (research as service) as well as the terms and content of flows between the localised CCs and the larger RTOs. Moreover, a shared mandate at interregional level can facilitate various types of partnerships.

Research question 3: Can less advanced regions benefit from the potential of their research units towards internationalised commercialisation of their research results?

The answer that resulted from the project, is “very probably so”. It was not totally clear whether less advanced regions can benefit from the potential of their research units towards internationalised commercialisation of their research results: it depends on whether they have research results to commercialise, on the methods they adopt for this purpose (question 2) and the regional triple helices flow content and coordination (regional authorities, question 4). During the project, we used as proxy types of projects funded and attitude of research units to the pilot action. This process is not straight-forward and needs to be given enough time within the strategy implementation. Regional policies should acknowledge expected returns to scale and include follow up projects and re-use of research initiatives.

It has been also discussed that regions lacking basic research cannot easily benefit from interregional research-to-business opportunities as they practically do not have much to commercialise. We tend to consider such kind of lack as a structural gap to regional innovation systems.

In this context, regions might wish to form long-term cooperations with regions that have relevant research bases. There needs to be a strategy of localisation vs. networked-based agents: a region needs to either develop or partner explicitly with regions that have relevant basic research. However, they also need to select and localise industry-related specialised knowledge flows actors (organisations, institutions), capable of promoting research-to-business or research-to-industry solutions, interacting also at regional, national and interregional levels. Clearly, the triple helix approach is essential: the BRIDGES pilot action experience indicates that much could be done by a coordinated approach between RTTOs and Structural Funds for example in commercialising research results through internationalisation.

Research question 4: Are win-win, research-to-business partnerships between advanced and less advanced regions possible, and what could be their base?

Win-win, research-to-business partnerships between advanced and less advanced regions are at least highly probable. Integration of interregional activities as tools for improving regional performance seems to be conditio sine qua non, an indispensable condition for both types of regions. Qualified intermediaries and availability of public funding to spur such efforts are necessary and RTOs can play an important role. It is also important to realise that the benefits for advanced regions will be more on strengthened economies of scale & diversification while for the less advanced regions, they will be more in the direction of strengthened economies of scope and specialisation. Policies should reflect such priorities.

Specialised knowledge-transfer intermediaries such as research and technology transfer organisations, either as independent entities or as front offices of university-based research units, are pivotal. It implies that (a) knowledge excellence commercialisation should be among the priorities of knowledge transfer intermediaries and (b) the qualifications of such organisations should be well defined and shared across the EU. Maybe, for example, the formal definition of RTOs could be scaled down to regional counterparts, in view of ensuring a continuity of mission & competences, especially in view of securing cooperation needs & potential.

Eventually, such an approach would allow advanced and less advanced regions to be able to cooperate more on content than on methodological know how transfer.

Research question 5: Do institutional and economic base proximities lead to successful interregional cooperation schemes?

The answer is 'not as such'. Finally it seems that institutional and economic base proximities cannot always lead to successful interregional cooperation schemes. While institutional proximities and cognitive proximities seem to be necessary conditions, they appear not to be sufficient ones. The commitment of regional policy makers is one of the decisive factors. It is also the encouragement provided by the larger systemic contexts (pull factor) and the related
incentives and support mechanisms.

Directionality can be reached through priority setting and initiatives towards joint interests and European Commission has a role in facilitating such processes and interventions while, at the same, trying to minimise bureaucracy and striving for synergies by streamlining framework conditions in different policy programmes, i.e. participation and funding rules in EU/national/regional programmes.

Lessons learnt & next steps

(1) For practically all regions, there are gaps between the RIS3-related industrial base and the competence resources the combination of which would lead to the construction of regional advantage. We discussed extensively the reasons for this phenomenon. It was observed that for five out of six regions, there are gaps between the RIS3-related industrial base and the competence resources - the combination of which would lead to the construction of regional advantage. The following causes were identified: (a) in some cases the low average education level of workers in the regions including those in the RIS3 industries, was neither conducive to direct knowledge transfers nor to knowledge spillover gains; (b) historical causes, e.g. destruction of well functioning regional ecosystems through the delocalisation of growth-driver industries and leaving behind a knowledge base with missing application base; (c) size of regions' population and regional markets, i.e. critical mass restrictions; (d) current economic growth as well as research patterns appear today much more dynamic and evolutionary than they were even maybe just 20 years ago, implying that industrial and R&D bases renewal are in (more frequent) demand.

One obvious conclusion is that possibly it would be worth for regions to opt for mixed approaches, combining improvement of localised resources with strategic transregional collaborations, leading to selective sharing & joint development of resources (instead of replicating) and improved competitiveness in the medium and long runs[99].

(2) For five out of six regions, innovation infrastructures meaning various types of research and technology transfer units including industry-led centres of competence, formally qualified RTOs[100] were missing or under-performing. This finding is confirmed for four out of five less-advanced project regions by the good practice transfer they prioritised[101] or the additional regional actions they took to support the project implementation[102]. At this point, the BRIDGES project can only indicate that the proactive, anticipatory, and networked type of knowledge-transfer function which, specialised & qualified intermediaries are expected to operate in the context of RIS3 implementation, cannot be overestimated. It was also observed that there might be a need to distinguish between business support intermediaries and specialised knowledge transfer intermediaries.

[99] *Kainuu* is currently (2019-2020) testing this approach through various initiatives, including the BRIDGES project, ELMO project (industrial transition), the Mining Regions innovation partnership, digital innovation hubs and two Baltic Sea Region Interreg projects. It might be that one of the first implications would be introducing some level of joint programming across regions.

Helsinki-Uusimaa has organised a 'RIS3 of the regions -group' to explore RIS3 synergies strategically across all NUTS Finnish regions.

[100] E.g. VTT in Finland, EARTO member (http://www.earto.eu/about-rtos.html).

[101] Kainuu, Goriska and Western Transnadnubia adopted good practices relating to specialised functions of research and technology transfer centres.

[102] Lubelskie, activated research and technology transfer centres.

(3) For the innovation-advanced region, the commercialisation of research through internationalisation appears an interesting option relating to increased returns to scale and follow up research options.

(4) For four out of six regions, there has been a tendency to confuse absorptive capacity with general awareness raising and training. Policy learning addressed this through the good practice transfer and the interregional exchange. The result is that three out of four regions introduced absorptive capacity activities into their action plans including policy impact: three partners adopted a good practice leading to improved absorptive capacity; one of them based the policy change (criteria in the ROP calls) on the absorptive capacity improvements effected through the good practice transfer.

5.

Annexes

5.1 Annex 1 Case study template

1. Case study identifier

Name of partner, PP number

Region and Member State

Type of partner institution (one choice)

Managing authority (MA)	
Intermediate body (IB)	
Regional development company (RDC)	

Any comments

answer

2. Regional development company in connection to policy makers

Privately owned, public equivalent	
Owned by the regional government, i.e. institutionally linked to the MA/IB	
Public owned, not institutionally connected to MA or IB	
Public owned, not institutionally connected to MA or IB, but hosting management of other branches of SF, e.g. Rural funds, Aquaculture funds, ..	

Any comments

answer

3. Status of the action plan

Progress to date (DATE HERE)

Formulated, not endorsed	
Formulated and endorsed, not implemented	
Action plan formulated, endorsed & implemented, including policy impact	
Action plan reinforced through the pilot action	

Overall results achieved

Interregional exchange without good practice transfer	
Good practice transfer	
Permanent types of connectivity	
Policy change	
Type of policy change	
Better projects (Type 1)	
Better policy governance (Type 2)	
New policy lines (Type 3)	

Any comments

answer

4. Outputs of the action plan

Types of outputs (more than one from the options below can be checked)

Investments in new products	
New products	
New services (functions of innovation infrastructures, regional research-to-business platforms)	
Mini-projects (commercialisation of research results through internationalisation)	
Awareness raising / training of businesses	
Some modification of ERDF calls	
RIS3 (thematic objective 1 -TO1) action lines	
Provisions for permanent interregional connectivities	
Processes for facilitating policy actions, e.g. feasibility studies	
None of the above	
Other	

Please elaborate on each one of the answers given in the list of outputs above: What is the action plan about? what was / is improved through the action plan? what did it achieve? what is the impact of the action plan?

answer

In case a region has checked the option “none of the above” please explain this case better and why nothing was achieved -if this is the case.

answer

5. Funds: how much was the budget of the action plan? Where was the funding coming from? How much is/was used for its implementation?

answer

6. The legacy of the main project theme, ‘research-to-business’

New product programmes/ some inspiration from the 2nd readings / inoputs from the feasibiltiy studies	
Increase of business absorptiveness to innovation	
Through research & technology transfer (RTOs) or centres of competence (CCs) initiatives	
Through the mini projects and commercialisation of research	
Interregional innovation partnerships	
Policy adjustments	
Other	

Any comments

answer

7. Good practice transfer and interregional technological connectivities

Which aspects of the good practices you selected for transefr have been the most useful and catalytic?

answer

In case you have tested and achieved institutionalising interregional connectivities (this will be more relevant to the pilot action partners), please share some of the experiences in developing the mini projects and in impacting the RIS3.

answer

In case you have tested and achieved institutionalising interregional connectivities has the role of RTOs become more crucial in the research internationalisation process, and how would you describe an ideal approach?

answer

8. Policy change, the role of the regional authorities and a shared RIS3 priority base

If your organisation is a regional development company: please describe your experience from your efforts to engage the regional or national policy maker to the project, the action plan endorsement and the policy change. Was the policy maker aware of the opportunities of bio-based industries beyond those listed in the RIS3? Have you learnt something about bio-based industries? What aspect of the cooperation with MAs/IBs has been the most difficult? Has funding been an issue? What seems to have worked? Has the role of stakeholders been relevant as, for example, potential beneficiaries from the project?

answer

If your organisation is a Managing Authority or an Intermediate Body: has the project opened some new perspectives in the bio-based RIS3 industries? Which aspect (-s) has been the most relevant and which ones the most difficult? Has policy change been a challenge? Has funding been an issue? What seems to have worked? Has the role of stakeholders been relevant as, for example, potential beneficiaries from the project?

answer

9. Difficulties and challenges
What were the difficulties / challenges in the formulation and implementation of the action plan? Has it been possible to override them? If yes, how was this achieved? If no, how much did this affect the whole action plan implementation? For example, do any of the following issues apply?
Managing Authority related: Lack of interest Excess of bureaucracy Different pace/timing Political changes (Elections...) Other **Stakeholders related:** Lack of involvement/commitment Defficient communication Logistic issues (Organization of meetings...) Structural changes (Dropping off of Stakeholders...) Other
Partner organization related: Lack of interest/commitment of the Management/CEO Staff issues (Changes...) Difficulties in the communication/cooperation with the MA Project timing/schedule adaptation Other Action plan related
Your organisation did not support the action plan The stakeholders did not sufficiently support the action plan The MA/IB did not support the action plan There was no funding for implementation The implementation proceeded but came across several challenges. Other
answer
For the future: what could / should be done differently?
answer
10. Contact information for the case study
Institution & project partner number Name E-mail

5.2 Annex 2 Action plans summaries

BRIDGES project, action plans' progress, July 11th 2019.

Three of the BRIDGES project action plans have been approved by the Interreg Europe programme on 1.7.2019. These are the action plans of the following regions alphabetically: Helsinki-Uusimaa, Finland (contributing opartner is PP4 –Regional Council of Helsinki–Uusimaa), Kainuu, Finland (contributing partners are PP1-Kainuun Etu Oy and PP2 -Regional Council of Kainuu), and West Macedonia, Greece (contributing partner is PP5 –ANKO)

Summary of the action plans of PP1/PP2, PP4 and PP5.

All three action plans focus on improving the RIS3 delivery effectiveness through new projects and by improving the governance of their Structural Funds. In addition, PP2, PP4, and PP5 have applied for a pilot action, currently under evaluation, Tools for transregional research-to-business partnerships. The concept and succesful aspects of the pilot action -if approved, will be integrated into the RIS3 revision of the regions.

Funds dedicated for the implementation of the three action plans add up to 1 438 200,00€, out of which 1 023 000€ is the Structural Funds participation.

PP1/PP2 (Kainuu, FI)

1) Strengthening of the circular economy in the bio-based industries sector, with the development of new applications in lignine (forest indsutry sideflow). One product development project will be assigned following an open call by PP2, and will aim at multi-level partnerships.

2) Strengthening of interregional innovation partnerships valorising natural resources & their side flows, especially addressing knowledge-based entrepreneurship, commercialisation of research, and internationalisation of measurement technology. The implementation will be through one action operated by PP2, and will aim at establishing an innovation platform according to the Joint Research centre (JRC) approach.

3) Impact on the innovation strategy (RIS3, under revision), including the pilot action contribution.

Access to the Kainuu action plan:
https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565773671.pdf

Funds dedicated: Structural funds:105 000€ (or a little more); National funds: 160 000€; Project funds: 52 000€ for the pilot action; Own funds: 46 500€ (for the pilot action; more own funding is foreseen for the RIS3 revision).

Contacts for more information:
Kainuun Etu Oy, PP1: Antti Toivanen, +358 44 5514559, antti.toivanen@kainuunetu.fi; Ninetta Chaniotou, +358 44 5514559, ninetta.chaniotou@kainuunetu.fi.
Regional Council of Kainuu, PP2: Jouni Ponnikas, +358 40 574 0804, jouni.ponnikas@kainuu.fi.

PP4 (Helsinki-Uusimaa, FI)

1) Facilitation of internationalisation of the research and innovation base: extending the range of activities of the 'EU services Office' of PP4, to facilitate internationalising the commercialisation of excellence and innovations of the region and review the pilot action applications by research units and RTOs. The service also facilitates meetings with research units / RTOs and SMEs when needed. The selection of research units /RTOs will be done following the Structural Funds process (open calls).

2) Impact on the innovation strategy (RIS3, under revision), focusing on mainstreaming the pilot action concept, *Tools for transregional research-to-business partnerships.*

Access to the Helsinki – Uusimaa action plan
https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1566302341.pdf

Funds dedicated: Project funds: 52 500€ for the pilot action; Own funds: 81 000€ for action plan as a whole.

Contacts for more information: Regional Council of Helsinki-Uusimaa, PP4: Ari Lainevuo, +358 50 3631657, ari.lainevuo@uudenmaanliitto.fi.

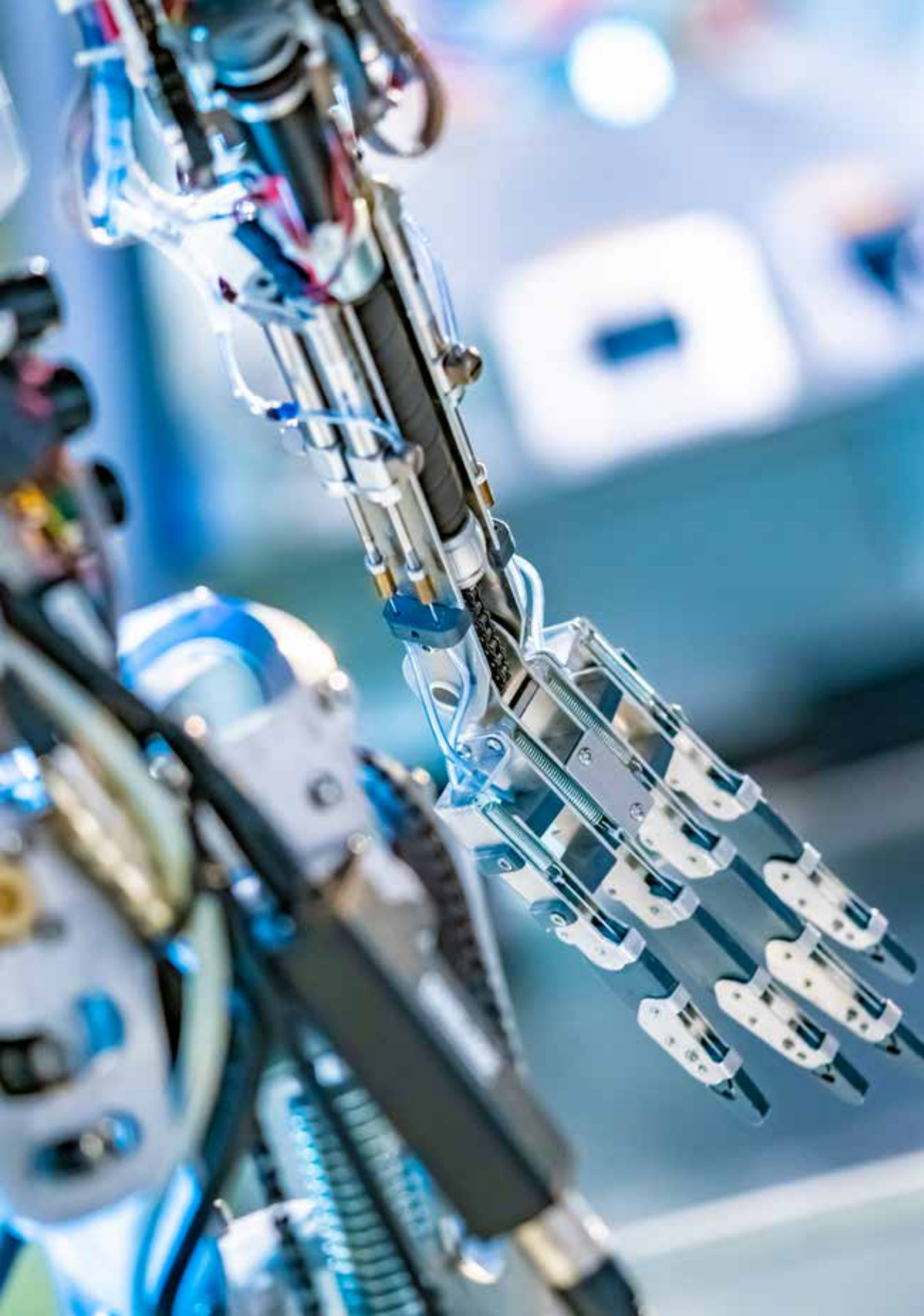
PP5 (West Macedonia, GR)

1) Improving the benefits of the West Macedonia structural funds for businesses by increasing their innovation absorptive capacity, and as a result improve innovation & SME competitiveness through investments addressed by the West Macedonia Regional Operational Programme 2014-2020 (ROP). The prioritised industries are (a) Wine: Enabling precision farming techniques and technologies, (b) Dairy: Precision Livestock Farming (PLF). Small scale PLF projects on dairy sector (lameness, traceability, animal behaviour); Environmental footprint: small scale mini-projects. (c) Horizontal actions, including (c.1) Advanced quality, traceability and safety in the agri-food chain: adoption and use of traceability systems in the Agri-food sector and (c.2) Dynamic Sustainability Management and Information Streaming for the Agri-food Sector.

2) Improve access to and awareness of the RIS3 by adopting on line interactive solutions.

3) W. Macedonia ROP to interregional research–to-businesses and business-to-research co-operations (interregional research eligibility- this is the pilot action), including funding for research-to-business mini projects and funding for follow up actions of mini projects.

Access to the West Macedonia action plan
https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565778528.pdf



Funds dedicated: West Macedonia, GR: Structural funds: 918 000€; Project funds: 23 200€ for the pilot action.

Contacts for more information: ANKO, PP5: Anastasios Sidiropoulos, +30 24610 24022, tsidiropoulos@anko.gr.

BRIDGES project, action plans progress, August 1st, 2019.

On July 25th 2019, two more BRIDGES project action plans have been approved by the Interreg Europe programme. These are the action plans of Goriška, Western Slovenia, Slovenia (contributing partner is Soča Valley Development Centre, PP6) and Lubelskie, Poland (contributing partner is Lubelskie Voivodeship, PP3).

Summary of the action plans of PP3 and PP6.

PP3 improves the governance of the Structural Funds by improving the uptake of the Lubelskie ROP funding by SMEs and expanding to benefits from national resources.

PP6 introduces new types of projects that required adjustement of the strategic focus of the Community Led Local Development Instrument (CLLD). In the 2014-2020 programming period, the LEADER method has been extended under the broader term Community-Led Local Development (CLLD) to three additional EU Funds: the European Maritime and Fisheries Fund (EMFF); the European Regional Development Fund (ERDF); and the European Social Fund (ESF), https://enrd.ec.europa.eu/leader-clld_en.

The focus is on the sustainable development and commercialisation of the aquaculture sector.

The enabling precondition for the implementation of both action plans was the adjustment (governance improvement (PP3) and change of strategic focus (PP6)) of the policy instrument (2014-2020 Structural Funds). One important impact shared by both action plans, is systemic impact resulting from the activation of knowledge-intensive actors of the regional innovation systems. Finally, the PP6 action plan demonstrates, how the concept of an advanced research agenda -defined beyond the region, can match to ”serve” a localised industrial agenda through a regionalised Centre of Competence.

PP3 (Lubelskie, PL)

In Lubelskie, four areas of smart specialisation have been identified: (1) bio-based economy, (2) medicine and health, (3) information technology and automation, and (4) low-carbon emission energy production.

The Lubelskie action plan consists of one unique action structured into four Activities dealing with improvement of the governance of the policy instrument; readiness of SMEs for photonics applications; readiness and applications of SMEs to apply to the Lubelskie ROP and to national funds; and evaluation.

PP3 invested considerably in the good practice transfer and the feasibility study. The good practice transfer focuses on an extended application of the BRIDGES good practice AUTODIAGNOSTIC TOOL FOR AGRO-SMEs (it can be accessed at: https://www.interregeurope.eu/policylearning/good-practices/item/157/autodiagnostic-tool-for-agro-smes/), a method helping businesses assess their innovation potential. The feasibilty study applied the extended AUTODIAGNOSTIC TOOL to SMEs active in bio-based industries. Lubelskie Research and Technology Transfer Organisations (RTTOs) attached to Lubelskie universities were important to gather businesses and facilitate the whole process. Dialogue with companies, RTTOs and MA led to creating better conditions for involved businesses to get structural funding. As a result the timetable of the calls under measure 1.5. was aligned with the BRIDGES action plan (the additional call has been organized in March).

The policy instrument was adjusted to (i) increase the maximum ERDF per project in Measure 1.5 Innovation Vouchers from 100 000 PLN (approximately 23 520€) to 300 000 PLN (approximately 70 563€) (29 January 2019); (ii) the project duration was raised from 6 to 12 months; and (iii) for Measure 1.2 Targeted Research an additional call will be organised in November 2019.

Access to the Lubelskie action plan:
https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565778266.pdf

Funds dedicated: Available Structural Funds approximately 70 563€ per processed case.

Contacts for more information:
Agata Kossakowska, agata.kossakowska@lubelskie.pl, +48814416545;
Dorota Skwarek, dorota.skwarek@lubelskie.pl, +48814416545.

PP6 (Goriška, SI)

The overall objective of the action plan is ensuring both *good state of the ecosystems and development of new products.*

The sector of aquaculture, identified within the Innovation map of the Goriška region as one with a very high potential, did not fit in the national RIS3 mechanism. PP6 cooperated with the MA at national level and the local CLLD, to "open up" the latter to project options inclusive of centres of competence, based on place-based approaches. The adjustment was officially confirmed on 23.4.2018 by the Ministry of Agriculture, Forestry and Rural Development of Slovenia.

PP6 invested in an extensive good practice analysis & transfer and a detailed feasibility study. From the Kantola good practice (https://www.interregeurope.eu/bridges/news/news-article/3270/site-visit-to-kantola/), the regionalised stakeholder platform and the master plan are transferred and adapted to address sustainable and competitive development of aquaculture. This process positioned the concept of an industry-led Centre of Competence as an objective and a tool for place-based development.

Access to the Goriška action plan:
https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1564654691.pdf

Funds dedicated: CLLD&SF 145 000€; own funds: 85 000€, total 230 000€.

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BRIDGES project, action plans progress, August 5th, 2019.

On August 2nd 2019, the remaining one BRIDGES project action plan was approved by the Interreg Europe programme. This was the action plan of Western Transnadanubia, Hungary (contributing partner is Pannon Business Network Association, PP7).

Summary of the action plan of PP7

The most important thing that the Pannon Business Network Association learnt from the BRIDGES project in relation to the action plan was to create a stable group of regional stakeholders and consolidate it as a long- term regional development platform supporting the digitalisation of the wood furniture industry. All representatives of the quadruple helix were invited to the stakeholder group which was a unique approach and boosted the communication, idea & project generation -and above all a regional consensus building tool.

PP7 aims at improving the uptake of additive manufacturing by the wood furniture industry in Western Transdanubia. For this purpose, PP7 adopted and adapted two good practices: the Kantola good practice (accessible at: https://www.interregeurope.eu/bridges/news/news-article/3270/site-visit-to-kantola/), and the AUTODIAGNOSTIC TOOL for AGRO – SMEs (accessible at: https://www.interregeurope.eu/policylearning/good-practices/item/157/autodiagnostic-tool-for-agro-smes/).

The Kantola good practice matches PP7´s priorirty for an industry-led Centre of Competence as an objective and a tool for place-based development. The regional platform -through its membership, ensures linkages to research excellence, mainstream research agendas, methodological facilitations & market leaders within & beyond the region, while the master ensures project generation tailored to address additive manufacturing as part of the business development actions in the region. The master plan, on the other hand, is the operational tool for defining and renewing the industrial agenda and targeted development action of the Centre of Competence. The Autodiagnostic tool for agro-SMEs is a methodology for addressing innovation absorptive capacity gaps of smaller businesses in traditional industries. The original tool will be extended to reflect wood furniture industry issues and then it will be applied to identify the state of play and improvement needs of SMEs.

Access to the Western Transdanubia action plan:
https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565169704.pdf

Funds dedicated for the implementation of the the action plan include 92 700€ from the Structural Funds (EDIOP) and own funding by the partner.

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6.

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