

Increasing the effectiveness of RIS3 implementation through university-to-industry interactions.

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<http://s3platform.jrc.ec.europa.eu/ris3-in-lagging-regions>

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1 Introduction

The formulation and subsequent implementation of national and regional research and innovation strategies for smart specialisation (RIS3) provide the foundation for the allocation of the 2014-2020 European Structural and Investment Funds (ESIF) across the EU⁷. However, the ability of regions across Europe to develop appropriate strategies and effectively translate them into economic growth is highly heterogeneous⁸.

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⁷ European Commission 2015 CONTRIBUTION OF THE EUROPEAN STRUCTURAL AND INVESTMENT FUNDS TO THE 10 COMMISSION PRIORITIES JOBS, GROWTH AND INVESTMENTS, December 2015.

⁸ EC (22.6.2015) Bringing Europe's "lagging regions" up to speed, https://ec.europa.eu/commission/2014-2019/cretu/blog/bringing-europes-lagging-regions-speed_en, retrieved 30.11.2016.

EC 2015 Lagging regions initiative, http://ec.europa.eu/regional_policy/en/policy/how/improving-investment/lagging-regions/, retrieved 30.11.2016.

Less developed regions, where growth is slow or at low levels, receive the majority of the ESIF. Main obstacles to knowledge-based growth in such regions include the lack of highly skilled human capital, the lack of a developed entrepreneurial culture, and low levels of absorptive capacity. Also lacking is sustained engagement among the quadruple helix of innovation stakeholders, particularly between industry and those in academia. The majority of SMEs, particularly in less developed regions, are micro-enterprises with low capacity to dedicate resources to research and innovation and high dependence on their regional innovation ecosystem. RIS3 strategies aim to better engage SMEs in this ecosystem, thus increasing their innovation potential, with improved access to both financial resources and human capital.

While smart specialisation implies an increasing focus on areas of strength, the formulation and implementation of RIS3, centred on an effective Entrepreneurial Discovery Process (EDP), can require the identification and subsequent exploitation of the potential for significant change. A shift towards more competitive, more specialised production may require regional stakeholders to pursue radical developments in either products or processes or even both.

Such developments may require these "radical diversification regions" to commit to university-to-industry interactions. The existence of an effective localised or at least regionalised innovation "ecosystem" within the region, facilitates the generation, transfer and absorption of knowledge. However, while university-to-industry partnerships are crucial for upscale path renewal, they have not been yet sufficiently addressed by the RIS3 literature, and their enhanced understanding of their structural role, particularly in the case of radical diversification regions, can inform both academic and policy debates.

In this paper, we examine key aspects of how university-to-industry partnerships are implemented in different European regional contexts, and aim at drawing conclusions for measurably and sustainably improved effectiveness of RIS3 implementation. The paper draws on evidence on such partnerships and approaches from the recent outcomes of two ongoing projects.

The "BRIDGES" project and the "Lagging Regions" project have closely complementary aims, but employ somewhat different methodologies towards their achievement. For example, the policy learning process, a central feature of both projects, follows different principles: in the case of BRIDGES, the policy learning is part of the good practice discussion; while the action plans focus on interregional patterns and university to industry partnerships based on the innovation maps produced by the project, i.e. a relatively narrow aspect of RIS3 implementation. In the case of the Lagging Regions project, attention has been focused on the more qualitative outcomes of providing targeted support to stakeholders in selected regions, fostering and building on their engagement in the EDP.

The article is organised in four sections: 1 Introduction, 2 University –industry interactions in BRIDGES project, 3 University-industry interactions in the Lagging Regions project, and 4 Discussion on findings and insights.

2 University –industry interactions in BRIDGES project

2.1 The aims and methodology of the BRIDGES project

BRIDGES is an Interreg Europe project approved in February 2016, with a five year duration. As with all Interreg Europe projects, it is organised in two phases:

- Phase 1 (2016-2019) - intensive policy learning and associated process for the transfers of good practices, leading to action plans; and
- Phase 2 - (2019-2021) implementation and evaluation of the action plans.

The objective of BRIDGES project is to improve the effectiveness of RIS3 implementation by addressing structural challenges, in this case mismatches between the knowledge and productive bases of non-innovation leader regions. The project argument is that such challenges can be remedied by strategically and operationally linking RIS3 priority industries in less advanced regions with the knowledge base available in another region, as a way towards faster and upscale growth while, at the same time, enhancing the embeddedness of the missing knowledge through good practice transfer on at least three fronts: innovation infrastructures, methodologies for innovation partnerships, and funding approaches.

Linking productive and knowledge/technology bases across EU borders requires, in the first place, that i) the advanced regions are willing to share knowledge and willing to work with the rest of the regions and look at the conditions under which this would be probable and ii) the less advanced regions have the understanding, possibility and willingness to invest in R&D outside the ESIF programme area. To address the first precondition we identified i) partner regions sharing three types of proximities: production base proximities (even if at very different levels –biobased industries as the RIS3 theme), technological proximities (at least a common understanding of), and relational proximities (Basile

2011⁹, the EU-wide application of the ESIF and and the RIS3 strategies); and ii) an innovation advanced region with a research policy including internationalisation of its research among its priorities (Uusimaa, FI¹⁰). The profile of the BRIDGES partnership is outlined in Table 1.

Region	Area(km ²)	Population	Income (€/capita)	IUS ¹¹ (2014 or 2015)
Kainuu, FI	22,687	75,324 ¹²	27,468	Innovation follower
Lubelskie, PL	25,122	2,139,726	10,172	Modest innovator
Helsinki-Uusimaa, FI	9,097	1,620,261 ¹³	47, 830	Innovation leader
Western Macedonia, GR	9,451	291,731	18,100	Modest innovator
Western Slovenia, SI	8,061	971,995	21,399	Moderate innovator
Western Transdanubia, HU	11,209	997,939	16,920 ¹⁴	Moderate innovator

To address the second precondition the project refers to the provisions of Article 70 and on Annex 1 of the Common Provisions Regulation (CPR¹⁵) -as this Annex is directly linked to RIS3 implementation, and prioritises cooperations between advanced and less advanced regions: primarily linking excellent research institutions and less developed regions and, secondly, building links in less developed regions as well as in low-performing RDI Member States and regions between innovative clusters of recognised excellence.

The target indicators of the linkages were self defined and are part of the BRIDGES project deliverables, 'numbers of enterprises cooperating with research institutions' except for the innovation advanced region that defined the indicator as 'number of research institutions cooperating with businesses outside Uusimaa', Table 2.

⁹ Roberto Basile, Roberta Capello, and Andrea Caragliu, 2011. Interregional Knowledge Spillovers and Economic Growth: The Role of Relational Proximity. Retrieved from Research Gate on 9.4.2017.

¹⁰ 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.

¹¹ IUS = Innovation Union Scoreboard

¹² http://www.stat.fi/tup/suoluk/suoluk_vaesto_en.html

¹³ http://www.stat.fi/tup/suoluk/suoluk_vaesto_en.html

¹⁴ Data 2011, <https://www.ksh.hu/docs/eng/xftp/idoszaki/gdpter/eqdpter11.pdf>, page 9

¹⁵ 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.

Table 2 Self defined indicator per project partner	
Number of enterprises cooperating with research institutions, Kainuu, FI	30
Number of enterprises cooperating with research institutions, Lubelskie, PL	60
Number of research institutions cooperating with businesses outside Uusimaa, Uusimaa, FI	5
Number of enterprises cooperating with research institutions, Western Macedonia, GR	40
Number of enterprises cooperating with research institutions, Western Slovenia, SI	40
Number of enterprises cooperating with research institutions, Western Transdanubia, HU	60

According to the project plan, these indicators will be reached during Phase 2 and beyond, by implementing the action plans formulated and approved (by ESIF managing authorities (MAs) and / or intermediate bodies (IBs)) during Phase 1. The action plans include also funding provisions, i.e. the partner regions have committed to minimal levels of financing of the action plans. The total commitments in the BRIDGES project are 3 600 000€, with highest contribution 900 000€ by Lubelskie and lowest by Uusimaa 150 000€, reflecting the different needs but also the dramatic differences in available structural funds for the respective partner regions.

To achieve these results, BRIDGES applies eight tools: i) the innovation maps; ii) good practice identification and transfer; iii) involvement of regional stakeholder groups (RSKs -which include also representatives of MAs and IBs); iv) interregional policy learning (IPL); v) mediation between the advanced and less advanced regions through additional activities facilitated by the advisory team; vi) external peer review; vii) endorsed action plans; and viii) implemented and monitored action plans.

If successful, the results of the project will enable:

1. The implementation of a framework for research / universities and businesses interactions, focusing on technological connectivity, between advanced and less advanced regions.
2. Rationalisation and clarification of the funding of such interactions, modelling transferrable win-win types of cooperations between advanced and less advanced regions.
3. Strengthening of industry-related expertise in the regions.
4. Strengthening of the integration of peripheral regions into the knowledge – based economy by strengthening the technological connectivity to knowledge centres.
5. Contributions to economies of scale and commercialisation of research of the advanced innovation region.

2.2 Building interregional university-to-industry linkages, the BRIDGES project toolbox

Within this context, the approach of the BRIDGES project, should be understood as an optimisation exercise: what will finally happen, what will finally be reached, is a function of three independent variables (the findings of the innovation maps, the good practices contributed, and the opinions of the regional stakeholder groups), facilitated by the mediation activities of the advisory team.

Table 3 Summary of the tools of the BRIDGES project			
Objectives	Tool	Description	
To identify, within the RIS3 subindustries innovation performers, and preferably innovation hubs on which to build research to business interactions; to identify and understand the innovation absorptiveness capacity in the regions and focus the actions plans and the 2nd readings.	Innovation maps	The innovation performers and hubs are identified according to 5 criteria, and the report contains references to the regional innovation system. Innovation maps for the base for i) the '2nd reading' of the regional potential and 2) assessment of the knowledge and methodology gaps in the regions, leading to interregional interactions.	
Good practices	Strengthen industry led centres of competence in the regions as a way to improve the effectiveness of RIS3 implementation	Good practice theme 1 Industry led centres of competence	Collect, analyse, and transfer GPs dealing with 1)the CCI concept as stated in the CREST group report (basically collaborative research and associated activities); and 2) innovation intermediary infrastructure functions supporting industrial specialisation and explicitly building on collaborative research.
	R2B partnerships addressing innovation processes in which the innovation is developed and brought further in collaboration between research and businesses	Good practice theme 2 Research to business innovation partnerships	Collect, analyse, and transfer GPs dealing with R2B partnerships addressing innovation processes in which the innovation is developed and brought further in collaboration between research and businesses, to come to deployment of the regional bio-economies. There are three relevant sub-processes, focussing on networks, innovation and finance. All three sub processes are relevant for regional innovations.
	Multilevel synergies addresses combination of funds and interregional partnerships outside projects, as ways of improving RIS3 implementation.	Good practice theme 3 Multilevel synergies	Collect, analyse, and transfer GPs dealing with multilevel synergies on 1) mismatches between RIS3 productive & RDI bases, 2) distance (geographic) from research excellence as a path to further specialisation, and 3) restricted resources towards RIS3 impact.

Table 3 Summary of the tools of the BRIDGES project		
Objectives	Tool	Description
To learn and exchange on the good practices of the project in view of formulating and implementing the regional action plans.	Interegional policy learning (IPL)	Well-orchestrated interregional learning and exchange sessions among the project partners, their stakeholders, peers and experts. IPL sessions are thematically organised across the partnership.
Ensure and deepen stakeholder engagement into the effectiveness of RIS3 implementation, including the acceptance of novel approaches and possible actions.	Regional stakeholder groups (RSK)	There are foreseen at least six RSK meetings per region, thematically aligned, but not exclusive of issue spending in the region.
Tailoring technological connectivity actions and research to business interregional cooperations to regional contexts Understanding funding potential Supporting the interregional scenario building in the regions	IWG1 (interregional working group 1)	To assess GP theme 1 contributions, and their relevance to the regions' needs, thus leading to partial or total GP transfer. Regions have prepared own task of evaluating their centres of competence (if any) & innovation infrastructures as concrete supporters RIS3 implementation. To bridge the gap between IPL and RSK discussions.
Strengthening the regional RIS3 related actions and increasing their visibility to peer groups.	IWG2 (interregional working group 2)	To bring together regional authorities, MAs, & IBs to discuss good practice theme 2 transfer and ways of supporting through GP theme 3 solutions.
	Reinforced learning, strengthening the internalisation of new concepts among project partners and their stakeholders	2nd reading of the regional potential, benchmarking criteria, benchmarking report, funding options, recommendations for the action plans, 1 internal peer review
To institutionalise research to business interactions and support the regional associated environment	Action plans	Planning and getting endorsed six action plans which i) institutionalise research to business interregional partnerships, 2) improve regional industry led centres of competence (or / and their associated hosts such as innovation agencies)
To involve the IE and peers in the BRIDGES action plans and maximise their quality.	External peer review	Critical review of the action plans of the six regions to focus better the final draft and enhance endorsement support.

Table 3 Summary of the tools of the BRIDGES project		
Objectives	Tool	Description
To implement the endorsed action plans.	Implementation	To understand the results of the action plans, to assess in the field the improvement of the RIS3 implementation effectiveness.

Source: Adjusted from Boden, M., Dos Santos P., Haegeman, K., Marinelli, E., Valero Boned S. 2016 European Parliament Preparatory Action: "Actual and desired state of the economic potential in regions outside the Greek capital Athens" Final Report, Joint Research Centre, retrieved 9.4.2017, <https://ec.europa.eu/jrc/en/printpdf/151819>.

2.3 State of play of key activities, 10.2.2016-31.3.2017

Six innovation maps, twenty-two good practices, and a first assessment of the interregional research-to-business needs have been produced during the first year of the BRIDGES project.

Summary of the findings of the innovation maps

The production of innovation maps is motivated by the need to understand the strengths of RIS3 industries in regions in terms of innovation, knowledge base and methodologies applied and in this way ensure the absorptiveness capacity of the knowledge-destination regions.

The issue of firms' innovation absorptiveness capacity is equivalent to the discussion on firms' absorptive capacity of external information. The issue has been under discussion since the 1950s, with an explicit connection to innovation since the late 1980s. The term 'absorptive capacity' was introduced in 1990 by Cohen and Levinthal¹⁶: "The ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends is critical to its innovative capabilities. We label this capability a firm's absorptive capacity and suggest that it is largely a function of the firm's level of prior related knowledge".

Absorptive capacities are also used to explain technology transfer among nations (interregional partnerships are such examples, multi level synergies, good practice theme 3 in BRIDGES) and the success of strategic alliances for innovation ([Vega-Jurado 2008](#)).

¹⁶ Wesley M. Cohen; Daniel A. Levinthal 1990. **Absorptive Capacity: A New Perspective on Learning and Innovation**, *Administrative Science Quarterly*, Vol. 35, No. 1, Special Issue: Technology, Organizations, and Innovation. (Mar., 1990), pp. 128-152, page129.<http://links.jstor.org/sici?sici=0001-8392%28199003%2935%3A1%3C128%3AACANPO%3E2.0.CO%3B2-5>

To identify the innovation absorptiveness capacity of the partner regions, desk research was planned, based on the following five criteria:

1. Bio-based economy businesses that have received public support (as leaders or part of a partnership) for innovative products development and which have invested for the product development during the last 3 years.
2. Bio-based economy businesses that have utilised advanced research services (e.g. material research measurements) during the last 3 years; single, short term cooperation.
3. Bio-based economy businesses that have been developing products through Research2Business innovation partnerships during the last 3 years; long term, comprehensive cooperation.
4. Bio-based economy businesses that have applied for patents (biotechnology) and /or IPR during the last 3 years.
5. Bio-based economy businesses that have applied for Phase 1 SME or Phase 2 SME Instrument (TRL 6 and higher).

The results show a concentration of activities primarily on the food processing sector, primary production, valorisation of forest industries side flows, and the furniture industry.

A key finding was that in many cases, RIS3 industries were internally heterogeneous in terms of productivity, innovation performance and capacity. All regions identified one or more individual businesses with relatively good innovation capacity, while, overall, the RIS3 industries' average productivity was relatively low. In some cases, lock-in of industries led to conflicts and shrinking of output. Moreover, in some cases, RIS3 implementation provisions were not defined at activity level (OECD, 2013) but rather at general (even sectorial) level. For those cases we understood there was content and maybe also methodological gap in the RIS3 scenario, and this gap, for the most part, was due to an imperfect EDP (entrepreneurial discovery process) during the planning stage. Finally, the starting point of BRIDGES project, i.e. on the mismatches (of content and/or interactions) between knowledge and productive bases of the non advanced regions, was confirmed.

Therefore, we re-organised the initial approach by distinguishing different types of actions that might be relevant to the regions. We classified the findings of the innovation maps into four types of possible actions related to RIS3 industries. For each one of the industries we prepared a coherent framework for the regions to follow, taking into account funding & financing provisions as well, and resulting, inter alia, to university / industry interactions.

- **Promotion of innovation and benefits from interregional cooperation:** direct interregional innovation partnerships (IIP), bringing together research from Uusimaa to advanced businesses

from all the other regions. The funding identified was through EUREKA options (collaborative research for commercialisation) for the interregional cooperations and the TEKES programme "New business ideas from research" for partnerships within Finland. To date, there have been identified two options from Kainuu and Western Macedonia, and two respective research institutions from Lubelskie. The relevant actors will meet in Helsinki and we will set up EUREKA applications. We expect 5-6 such cases. Some of the regions have patents. It is possible that the patents, if relevant to other regions, might be commercialised, and this will generate more innovation partnerships.

- **Modernisation of RIS3 industries and clusters:** this is the core of modernisation actions in Kainuu, Lubelskie, Western Macedonia, and Western Slovenia regions and linking to local primary sector. We focus on non-price competitiveness factors. Modernisation can be in terms of improved or new products but also in terms of processes. These areas would have been part of the entrepreneurial discovery process (EDP) but it was found missing (one common question was "what to produce"). We have proposed to the relevant partners to adopt the PDL concept (Project Development Lab, [Boden 2016](#)), and include interregional expertise in this process as a way to avoid localised lock-ins, which is a common characteristic of peripheral areas. The interregional 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 principle, we have proposed to institutionalise the PDL approach as part of RIS3 sub industries strategic plans formulation. One result could be comprehensive modernisation activities including strengthening of the knowledge and the research base. For example, we are discussing with three regions industry-led centres of competence interregional actions. Another result could be actions to improve the TRL (technology readiness level) of the businesses.
- **Renewal of industries,** i.e. those traditional industries with outdated or latent status, still relevant today, and with a remaining knowledge base. One example of renewal of industries comes from Western Transdanubia, focusing on the furniture industry; another is from Kainuu, aiming at strengthening a cluster valorising side flows from the chemical wood industry. We expect, in this case comprehensive approaches to industry renewal with in depth industry development plans.
- **Supporting further RIS3-aligned strategic partnerships:** The innovation maps, indicated thematic cooperation potential among a few of the project regions. One such theme identified is the berry sector, currently bringing together R1, R2, R3 and also R7 (region from the advisory team). Partners are currently working together to propose a concept note to the Agrifood platform.

Progress to date: At the moment we acknowledge uneven progress among the regions (mostly due to Entrepreneurial discovery process (EDP) gaps. From the perspective of the innovation leader region, the process for identifying research institutions and relevant universities has started as well as inquiries on interregional funding options have started, and exchanges with TEKES have to date been encouraging. The first cooperation schemes are outlined (four at the moment). The regions that have taken the forward steps allow us to pilot our approach and test possibilities. In the following period,

we expect the EDP gaps to be addressed and regions to conclude, select and commit to those of RIS3 actions that are suitable to them. With some of the partners (regions R2 and R6) we are considering comprehensive modernisation actions, such as programmes for industry-led centres of competence. The process is evolving from day to day.

Summary of the findings of the good practices

During this period there have been collected twenty-two good practices. Eight contributions have been made to GP theme 1, and seven contributions to each of GP themes 2 and 3. The project advisory team is currently assessing them and writing the capitalisation report. The first results indicate that a number among them appear to have high transfer relevance. The good practice transfer will apply to localised improvements and towards facilitating interregional partnerships.

Interregional university to industry partnerships

The innovation maps and the subsequent discussions between each regional partner and the advisory team, show that technology-based linkages between advanced and less advanced regions are very much needed and that, while they are inclusive of the project objectives, they also go beyond them, generalising the demand for knowledge transfer services. As a result, the initial research-to-business objective has been re-interpreted to allow the inclusion of all types of knowledge transfer needs, i.e. the university-based ones. For example: most stages of innovation management of a new product require university –industry knowledge transfers which, , are often not yet localised; deploying KETs in a region requires expertise that is not available in the region; formulating industry renewal or modernisation concepts, all require both industry specific and research competence expertise.

In general, the knowledge transfers identified as relevant to the BRIDGES project objectives can be classified as:

- Contributions to product innovation management
- Industrial renewal and modernisation plans
- Strengthening the competence and excellence bases in the regions coherently with RIS3 industries
- Deployment of KETs
- Deployment of Industry 4.0 solutions (digitalisation of the manufacturing process)
- Assessing TRL of businesses and taking measures to go to the next level.
- Promotion of innovation and benefits from interregional cooperation
- Cross-border joint commercialisation actions
- Joint development and good practice transfer actions (e.g. H2020, Interreg programmes)

- Other types of innovation partnerships, such as participation in industry-specific platforms.

Table 4 summarises the findings to date, how they connect to contributed GPs, and a proposed level difficulty to access resources (‘competitiveness stress’ column). The full range of funding sources for these activities are yet to be fully assessed, and there may be resources beyond the ESIF. We note that sometimes, the solutions are not regional but need to involve the national level as well.

Table 4 Types of interregional cooperation emerging in the BRIDGES project		
Identified need for interregional cooperation	Competitiveness stress	Tools
<p>Businesses ad hoc access to research services not available in their MS (service costs); R&D Council, turning ideas into technology concept; Proof of concept, testing of prototype, scaling up; TRL assessments; TRL upscaling (plan)</p> <p>Researchers travels to co write project application in another MS</p> <p>Businesses and researchers travel (as team) to co write application in another MS</p>	+	<p>Innovation vouchers with interregional eligibility</p> <p>tool type: GP transfer and / or enhancement</p> <p>About 5000€ per case, post paid, application to the MA/IB</p>
<p>Research and businesses potential for commercialisation of research benefiting from interregional complementarities; issue not covered by other programmes</p>	++	transfer tool type GP transfer
<p>Region’s knowledge, research and methodology bases need strengthening / completing if industrial modernisation and / or renewal are to be realised.</p> <p>Deployment of KETs.</p> <p>Deployment of Industry 4.0</p>	++	<p>Competence and excellence interregional programmes for industrial modernisation and / or renewal.</p> <p>New Tool to be introduced through BRIDGES project</p>
<p>Joint development and / or good practice transfer possibilities.</p>	++++	<p>Highly competitive projects</p> <p>type of tool: existing tools outside the project partnership</p>
<p>Wider, industry-based strategic innovation partnerships, e.g. Agrifood platform; achieve “controllable” economies of scale in terms of concrete</p>	+++	<p>Concept note and the funding in the future</p> <p>type of tool:</p>

Table 4 Types of interregional cooperation emerging in the BRIDGES project		
Identified need for interregional cooperation	Competitiveness stress	Tools
industries		existing tool outside the project partnership

3 University-industry interactions in the Lagging Regions project

3.1 The aims and methodology of the Lagging Regions project

The "**Lagging Regions**" project¹⁷ of the European Commission's Joint Research Centre, working in cooperation with the Directorate General for Regional and Urban Policy (DG REGIO) implements two Preparatory Actions of the European Parliament.¹⁸ Centred on providing targeted support to selected regions in the implementation of their RIS3, this project is at the core of the JRC's smart specialisation strategy activities. It builds on the specific support activities and consequent positive outcomes of a previous JRC/DG REGIO/European Parliament project on the refinement and implementation of a RIS3 strategy in the Greek region of Eastern Macedonia and Thrace (REMTh).¹⁹ Also under the JRC Lagging Regions project umbrella is the "Higher Education and Smart Specialisation (HESS)" project.²⁰ Carried out in cooperation with the Commission's Directorate for Education and Culture, HESS aims to align human capital supply with smart specialisation priorities (regional demand) and strengthen the contribution of higher education institutions (HEIs) to regional innovation systems.

The Lagging Regions project aims principally to develop and provide appropriate and specific support to the implementation of RIS3 and related activities in selected lagging regions. This entails:

¹⁷ <http://s3platform.jrc.ec.europa.eu/ris3-in-lagging-regions>

¹⁸ "RIS3 support to Lagging Regions" and "The economic competitive advantages and the potential for smart specialisation at regional level in Romania."

¹⁹ For a summary, see Boden et al. 2016, Implementing RIS3 in the Region of Eastern Macedonia and Thrace: towards a RIS3 tool box, JRC S3 Policy Brief Series No. 20/2016 – available at: <http://skp.jrc.ec.eu.int/skp/showPub?id=JRC101739>

²⁰ Details at: <http://s3platform.jrc.ec.europa.eu/hess>

- Providing support selected regions in the identification of economic competitive advantage and the exploitation of innovation potential, building on a process of entrepreneurial discovery;
- Ensuring a coherent, coordinated and sustainable approach, to secure, develop and enhance engagement of all relevant stakeholders (business, academia, research organisations and civil society); and
- Enhancing the linkages between RIS3 strategies at regional and national levels.

Working with a number of individual regions also enables the development and implementation of horizontal approaches to key issues in the growth and governance of lagging regions. The outcomes of both the work with specific regions and the horizontal work contribute to:

- Improved understanding of slow and limited growth in EU regions and links to macro-economic framework conditions, taking RIS3 as an entry point.
- The development and dissemination of lessons and a tool box for other EU regions; and
- Contributions to more theoretical debate on RIS3 by codifying hands-on experiences.

The project targets two types of regions, namely low-growth regions and underdeveloped regions.

- Low-growth regions are regions of Member States that have a GDP per capita in purchasing power standards (PPS) below the EU average in 2012 and that did not converge with the EU average between 2002 and 2012, i.e. regions in Greece, Italy, Spain and Portugal.
- Less developed regions are those with a GDP per capita in PPS below 50% of the EU average in 2011, i.e. a number of regions in Bulgaria, Hungary, Poland and Romania.

Nine partner regions have selected based on these and other practical criteria. These are listed in Table 5.

Table 5: Targeted RIS3 support to lagging regions

Country	Regions
Romania	RO21 - Nord-Est RO11 – Nord-Vest
Bulgaria	BG32 - Severen Tsentralen
Poland	PL 62 - Warminsko Masurskie
Hungary	HU3 Észak-Alföld
Greece	EL11 – Eastern Macedonia and Thrace (REMTh) All regions in Greece - impacts of REMTh work
Italy	ITF4 – Puglia

Country	Regions
Portugal	PT16 – Centro
Spain	ES43 – Extremadura

Activities in each region include various stakeholder events, designed to provide specific and appropriate support for critical aspects of RIS3 implementation, as well as cross-cutting activities focused on common concerns. Carrying out these activities entails developing partnership with various key stakeholders, at regional, national and European levels, as well as the selection of appropriate approaches. Building on the REMTh project, a toolbox of approaches to support RIS3 implementation has been developed (Table 6).

Table 6: Lagging Regions Tool Box

Objectives	Tool	Description
Idea generation, trust building, structure and support stakeholder interaction	EDP focus group	Step-by-step approach to identify or refine RIS3 priorities involving the quadruple helix of stakeholders
Open up to wider (online) communities	Online stakeholder engagement	Online tool for wider information sharing. Also used for idea prioritisation, partnership formation, online idea development, etc.
Address brain drain, build skills	Mobility Working Group	Bottom-up approach to develop a joint strategy and roadmap for increasing cross-sectoral and international mobility and other types of skill development. Critical elements - joint development and joint implementation by all actors involved.
Increase coordination between national and regional level	Project Development Labs	Coordinated approach to analyse funding and other implementation issues for business ideas.
Widen funding sources for idea implementation		Specific advice on the use of alternative funding sources for specific ideas
	Online RDI Funding Guide	Online overview of available funding sources
Optimise a RIS3 governance structure	Governance working group	Bottom-up approach to develop a joint strategy for RIS3 governance. Critical elements - joint development and joint implementation by all actors involved.
Support ongoing stakeholder engagement	Stakeholder round table discussions	Well-orchestrated and focused stakeholder discussions.
Identification of barriers and possible solutions		Tailored peer review events
Mutual learning	Board of critical friends	International project steering group of experts from different backgrounds (peers, business, academia)
Support international cooperation		

Table 6: Lagging Regions Tool Box

Objectives	Tool	Description
	<p align="center">Collaboration spotting tool (developed through CERN-JRC collaboration)</p>	<p>Quantitative visualisation tool for identifying potential international R&D partners in specific cooperation areas</p>

Source: Boden, M., Dos Santos P., Haegeman, K., Marinelli, E., Valero Boned S. 2016 European Parliament Preparatory Action: "Actual and desired state of the economic potential in regions outside the Greek capital Athens" Final Report, Joint Research Centre

The EDP: catalysing University – industry interaction

Central to stakeholder engagement, meaning engagement both with the S3 process and with each other, is an ongoing series of **Entrepreneurial Discovery Process** focus groups. These aim at exploring and refining the areas priority areas defined by the partner regions in their RIS3 strategies. Based on a novel approach from the JRC, these events seek to bring together actors from the quadruple helix²¹ of business, policy, academia and civil society in the partner regions. Furthermore, external experts in the priority area are also typically invited to help catalyse discussions.²²

The desired outcome is to generate both feasible business ideas and to forge working partnerships, particularly between university and industry. To this end, the EPD focus groups are organised with the following objectives:

- To bring together relevant stakeholders in the sector, throughout the value chain to explore and catalyse the dynamics of the entrepreneurial process of discovery;

²¹ Arnkil R., et al. 2010, Exploring Quadruple Helix. Outlining user-oriented innovation models. University of Tampere, Work Research Center, Working Paper No. 85 (Final Report on Quadruple Helix Research for the CLIQproject, INTERREG IVC Programme).

²² Boden, M., Marinelli, E., Haegeman, K., Dos Santos, P. 2015. Bridging thinkers and doers: first lessons from the Entrepreneurial Discovery Process in Eastern Macedonia and Thrace. S3 Policy Brief Series No.14/2015. Luxembourg: Publications Office of the European Union. Available at: <http://publications.jrc.ec.europa.eu>.

- To increase the understanding for the need to select a limited number of priorities, and to build trust among stakeholders, including with public authorities;
- To examine key criteria to identify and pursue relevant projects for the region;
- To collect ideas for regional innovation that combine regional strengths with international (emerging) trends;
- To shape initial partnerships around those ideas, to foster a culture of collaboration, between stakeholders and with public authorities and to increase awareness of the international context of regional innovation activities; and
- To further refine the focus group approach for its ongoing application to other key sectors and other regions.

Preparation of the focus groups entails: desk based analysis of the value chain of the priority areas under consideration; identification of likely topics for discussion; and the identification of relevant regional, national and international participants. Examination of the value chain is particularly valuable in preparing the events, and has duly been enhanced.

Typically, the focus group approach combines plenary and parallel sessions, with interventions by regional, national, and international experts. To date, the events have achieved good visibility in the regions, with increasing numbers of regional stakeholders, including a significant proportion of industrial stakeholders. Within the focus groups, each parallel group is tasked with exploring promising ideas in selected subsectors of each of the priority areas examined.

In addition to the specific outcomes of the discussion, including increased awareness and understanding of the priority, concrete ideas and working partnerships, the events also contribute to trust building, understanding of the S3 concept and processes, increased and propensity to collaborate. It is also hoped that both the EDP will be a continuous, sustained process. A positive outcome is that regions have subsequently continued with EDP focus groups themselves, based on the JRC approach. Furthermore, the approach has also been adapted and employed by regions outside the project (particularly in Greece).

The methodological approach to the EDPs has been progressively refined in view of continued replication and adaptation.²³

²³ Boden, M., Marinelli, E., Haegeman, K., Dos Santos, P. 2015. Bridging thinkers and doers: first lessons from the Entrepreneurial Discovery Process in Eastern Macedonia and Thrace. S3 Policy Brief

Subsequent activities have included a combination of (so far) a limited number more focused workshops ("Project Development Labs") and on-line idea consultation aimed to deepen stakeholders' exploration of the more practical business and research dimensions of promising ideas. These activities focus on the knowledge requirements for taking ideas forward, the development and use of partnerships, and, most importantly, the sources and likelihood of funding. PDL events have the following objectives:

- The further advancement of ideas developed in EDP focus groups, as well as the reinforcement of communities building around them.
- Capacity building among stakeholders for idea development and the use of different funding sources.
- Increased coordination between regional and national level, through alignment of national and regional plans (and avoiding funding of similar ideas at both levels); and
- Clarification of technical challenges to implementation (e.g. state aid rules).

Cross-cutting Perspectives

The project also carries out a number of cross-cutting activities, designed to address common issues and generate more widely applicable lessons. These centre on the establishment of dedicated working groups of relevant stakeholders from partner regions. Groups have been already been established to examine issues of RIS3 governance, human resources and monitoring RIS3 implementation. These have been mobilised with the support and guidance of selected independent experts.

In REMTh, a working group on **governance** sought to combine bottom-up and top-down engagement in refining the region's governance system for RIS3. Its activities drew both on existing structures and experiences in the region as well as the legal changes envisaged to be implemented from the national level downwards, ensuring that the responsibilities of the Managing Authority of the region extended beyond simple administration of funds. The outcome of the groups was a vision for a future RIS3 governance structure comprising three levels: an upper strategy level; a central coordination and management level; and a lower level of more inclusive "Innovation and

Series No.14/2015. Luxembourg: Publications Office of the European Union. Available at: <http://publications.jrc.ec.europa.eu>

Entrepreneurship Networks" refining and implementing the priorities, sustaining the EDP, and fostering more proactive university industry interaction.

In the same region, a working group on human resources was set up to examine ways to enhance human resource mobility in the region, better matching supply and demand, and again reinforcing links between the industrial and university sectors. The working group proposed a number of both short and longer term steps, based on linkages between the business and research sectors within the region, as well as improved integration of the region in global knowledge networks. The resulting action plan aimed to enhance collaborations with high-ranking research universities, exploiting inward and outward mobility schemes, promoting co-publication and international collaboration in competitive research projects, such as Horizon 2020.

The horizontal dimension of the project also extends beyond the partner regions to bring in wider peer expertise. An advisory group of experts from (regional) government, academia and business across Europe has been established to provide guidance on the basis of experience in facing similar challenges. *De facto* this body also played a further role in the wider outward transmission of lessons from the project.

4 Discussion on findings and insights.

BRIDGES project: next steps and challenges

The BRIDGES project aims at improving RIS3 policies in all the regions through

- concrete investment plans for a number of businesses based on university/industry partnerships, through improved criteria for projects of the regions' ESIF (+ other funds if needed)
- and
- policy impacts related to the investment plans in terms of ESIF funding criteria, (and other national funding when possible), ensuring that university/industry exchanges and a partnership approach are eligible.

During the first year of the project implementation, parallel to the innovation maps, the good practice contributions, the regional and interregional policy learning sessions, a number of methodological challenges emerged and were addressed. In the following six months, the priorities are four: i) the innovation follower regions need to make concrete selection of the modernisation and renewal activities for the RIS3 sub industries identified in the innovation maps, and thus address –partially- the

EDP gaps. The advisory team is expected to support this process discussing several options with the regions (this is the '2nd reading of the regional potential'); ii) the identification of knowledge and methodological gaps in the regional innovation system of the innovation follower regions needs to be completed; iii) face-to-face and / or online exchanges between the innovation leader region's research institutions and the innovation follower regions need to take place; iv) the good practice analysis and selection for transfer, facilitated by the advisory team through IWG1 and IWG2 sessions and additional online exchanges, should be completed.

The most important challenge in the forthcoming period will be to commit the MAs and the IBs to funding schemes for interregional cooperations. Some preliminary work has already been done, by identifying possible categories of interregional cooperation needs resulting from the analysis of the innovation maps and linking them, in principle, to funding concepts, both indicated in Table 4. During the next six months, these concepts will need to be made concrete for each one of the innovation follower regions.

Lagging Regions: Outcomes and challenges ahead

The work on REMTh and the first phase of the wider Lagging Regions project has already begun to impact the partner regions, both in terms of the concrete activities of stakeholders and their interactions. Some first outcomes include:

- The development of the necessary constructive working collaborations with the partner regions based on mutual understanding and trust;
- Concrete steps in refining their respective RIS3 priorities through targeted support to EDP related activities, resulting in concrete ideas and working partnerships;
- Creating and supporting momentum for change, such as in the sustained efforts for the EDP and its impact on the local strategies; and
- An increased understanding of the concept of RIS3 and the complexity of respective implementation challenges.

Central to these positive outcomes, particularly in relation to EDP, is the engagement of the different stakeholder communities relevant to specific priority areas. Emphasis has been placed on bringing together the research and industrial communities and encouraging interaction through a structured and inclusive approach. Sustaining these interactions, and the necessary changes in stakeholder behaviour over time, are key challenges for implementation of smart specialisation strategies. This

provides a solid basis for further work with partner regions as well as for dissemination of the wider lessons.

The project thus seeks to build on progress to date and to address the identified challenges, both widening the scope of the work, and through further close engagement with stakeholders in the partner regions.

Complementarities

This paper represents an important first step in bringing together two projects with clear shared aims, but different approaches. It provides a basis for identifying a number of key complementarities and thus the potential for continued and more focused collaborations. These include the following:

- At the core of both projects is the identified central role of stakeholder engagement, particularly that of the research and industrial communities in taking S3 further forward, as well as the need to better catalyse this engagement. S3 can thus be seen to provide an opportunity for this.
- Participation and Engagement– both projects work with committed and varied groups of partner regions. This provides for an extended base of experience and circumstances, and thus for mutual learning, as well as wider dissemination and interactions at national level.
- Support to the regional stakeholder groups: both projects adopt a guided approach towards the stakeholders, BRIDGES project through the two interregional working groups and the mediation of the advisory team, Lagging Regions through involvement of the project team in the local groups. It would be useful to compare the process and its characteristics as well as the results they achieve. This could be done through a joint working group.
- Both projects combine analysis with tools addressing the more practical challenges of RIS3 implementation. Bring these together, the production of systematic innovation maps, might shape and further structure stakeholder interaction.
- BRIDGES focuses patterns of interregional technological connectivity & related solutions, while Lagging regions builds on EDP. This means that BRIDGES could learn from Lagging Regions EDP approach while Lagging Regions could strengthen technological connectivity in their EDP solutions. This could be done through thematic workshops.

In the next steps, the two projects will meet to define better their common ground and joint activities, (e.g. joint events such as thematic workshops and / or working groups).

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