Perspectives for Research and Innovation Strategies for Smart Specialisation (RIS3) in the wider context of the Europe 2020 Growth Strategy

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Perspectives for Research and Innovation Strategies for Smart Specialisation (RIS3) in the wider context of the Europe 2020 Growth Strategy

This report was written by the Expert Group established to assess the contribution of "Research and Innovation Strategies for Smart Specialisation" (RIS3) to the Europe 2020 Growth Strategy

2015 Directorate-General for Research and Innovation

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FOREWORD

Given the residual challenges from the economic and financial crises of the last years, and the uneven progress towards the targets of the Europe 2020 Growth Strategy, "business as usual" is just not an option for national and regional administrations seeking to re-ignite economic growth, and to ensure sustainable high-quality employment and quality of life in their regions. Moving to an open and forward looking trajectory, strengthening strategic competence, introducing resilience into the innovation management systems, and proactively and competently seeking synergies between all EU, national and regional support programmes offers new perspectives for improved place-based growth in Europe's regions. Moreover, it also offers an unprecedented possibility for an innovative Europe - including a renewal of the Innovation Union and of other large Initiatives directed towards Europe 2020.

Important changes in this respect have already been enacted, including the fundamentally new direction and the structural reform of the EU Cohesion Policies for the 2014-2020 Programming Period.

After reviewing Research & Innovation Strategies or related Action Plans of the regions and Member States of the EU-28 submitted to the European Commission in 2014, our conclusion is that the high-level political decisions already taken are moving the EU in the right direction, and that many motivated and motivating initiatives have started in the regions. Given the fundamental changes, it comes as no surprise that there is still much to be achieved, going beyond operational and policy aspects, and including not only a change of mind-sets but also significant strategic capability building within the regional innovation eco-systems at large.

Based on our findings, we offer a broad spectrum of suggestions for the way forward – accompanying the 2015-2020 Cohesion Policy implementations and contributing to the base for the subsequent Programming Period.

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TABLE OF CONTENTS

LIST OF FIGURES

EXECUTIVE SUMMARY

This report by a group of independent experts established by DG Research and Innovation has set out to assess the contribution of "Research and Innovation Strategies for Smart Specialisation" (RIS3) to the Europe 2020 Growth Strategy in the wider context of research and innovation policies. Reflecting this context, Smart Specialisation has been highlighted by the Innovation Union Flagship[1] and the Communication "Regional Policy contributing to smart growth in Europe 2020"[2] and forms a key element of the European Commission's current Cohesion Policy.

Even before the term was coined, the Smart Specialisation approach was a proven success strategy of advanced regions and enterprises. Although not an invention of the European Commission, it could, however, become a true EU innovation, if its basic principles are successfully applied across the EU-28, and, especially, if they enable a better integration of the EU's less innovative regions in the European Research and Innovation Area (ERA) and in the globalised economy. In this line of thinking, the purpose of this report is to help both with the implementation of the adopted RIS3 and, where Member States have not yet adopted their RIS3 so far, with finalising those. The expert group's aim was to look at optimising the impact of public and private investments in research and innovation through smart specialisation. Rather than assessing individual RIS3, which is the task of the respective official bodies, the expert group has set out to draw lessons from the broad spectrum of available strategy documents. The objective is to improve design and implementation of future (regional) innovation, research and related strategies, and the subsequent development of smart policy mix at multiple governance levels.

Conclusions

On the basis of the documents available for review the expert group could conclude that progress is made, but it's still a bumpy road lying ahead. Developing and implementing successful R&I policies in today's highly competitive global environment is a demanding task even for the experienced and long established R&I policymaking authorities and their advisory bodies. Therefore, it comes as no surprise that we found numerous deficiencies in the analysed processes, where a multitude of actors not specialised in this field – at regional, national and EU level – were faced with the challenge to design and decide on the massive R&I investments required by the ESIF regulations.

We also saw signs of a still unstable RIS3 governance: the long and complex RIS3 development process (without even talking about its implementation) is often not yet coherently structured, prone to all kinds of breakdowns, and can still be discontinued at key junctions. We saw cases, where participative strategy processes have taken place in the regions, or productive benchmarking exercises have been implemented, but key results have not appeared in the formal RIS3 negotiated between the national and the EU authorities.

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[1] COM(2010)546 of 06/10/2010

[2] COM (2010)553 of 06/10/2010

The "Entrepreneurial Discovery Process" (EDP) as described in the guiding documents is, conceptually and methodologically, an up-to-date approach to arrive at attractive R&I investment options, which are less risky for public and private actors, and thus more likely to be implemented. In many cases, we didn't see such a process, or it was not clear if key requirements were met, e.g. participative governance, advanced methodological approaches, or evidence based guidance to position innovation eco-systems in global value chains.

There is still much room for improvement for fully harnessing synergies with Horizon 2020 and the large number of other EU support programmes available. From what we saw it became evident that more operational guidance is not enough for substantial improvement. It also requires structural changes concerning governance mechanisms and the use of strategic business and policy intelligence tools that relate or complement policy instruments across governance levels, across borders, and across policy domains and administrative bodies.

RIS3 will demonstrate value only if competent actors plan strategically and invest accordingly. We have seen not many references to the methodological competences necessary for advanced strategy processes, and often 'priority areas' are too broad to serve as the base for optimised investment plans. If appropriately implemented, a RIS3 process could generate not only the knowledge, but also the trust and understanding needed for individual innovation actors committing to focused investment priorities agreed at regional or Member State level.

"Openness" is still not well developed in most of the reviewed strategies, although this is a key factor in globalised economies, inherent for decades in EU R&I policies, and specific facilitating regulations have been put in place in the current Programming Period. Even the cross-border dimension (beyond Interreg) remains marginal. Overall, we observed "more of the same", i.e. regions, which are already internationally well connected, devote more attention to external connectivity than regions with currently poor international linkages.

By the time of finalising this report (January 2015) not all countries and regions have managed to complete a full RIS3 process in the already extended timeframe, and now have to finalise their RIS3 (in theory a pre-conditionality to ERDF R&I investments) in parallel to implementing concrete actions in their action plan framework. As these are mostly the cases, where ERDF funding provides the lion's share of all public R&I investments it is all the more important to support those regions to take advantage of the full potential of a true RIS3 process.

To complete the picture, we also want to stress that there were examples where the new Cohesion Policy approach has already born its fruits in the form of well-developed RIS3 that had opened minds, were translated into dedicated regional strategies, and inspired new integrated policy approaches.

The mixed picture we found (for the full set of conclusions cf. chapter 5.1) should not come as a surprise: there is no 'quick-and-dirty' approach to sound economic transformation agendas.

Recommendations

The RIS3 process doesn't end with a glossy publication: it is simply the start of a new set of roads to travel. Therefore, the expert group has not stopped with the conclusions on what has happened so far. It has rather taken this unique opportunity - to assess a broad spectrum of strategy documents across the EU-28 - to develop a spectrum of recommendations, short-, medium- and long-term, for the different actor groups involved in the RIS3 multi-level governance (MLG) approach.

The following reflects the permeating themes "governance" and "competences" (the full set of recommendations can be found in chapter 5.2):

Overarching recommendations to all involved in the different phases of the Cohesion Policy cycles

- In the short term: harness the full potential offered by the Shared Management System to integrate the RIS3 implementation and outcomes, not only at the milestones such as the final agreements on the remaining OPs or the mid-term reviews of all OPs. Improve knowledge feedback flows in general, e.g. from regional evaluations and assessments.

1.1

- For the future: Develop - from a support- and enabling perspective - a holistic view of the "Cohesion Policy knowledge transformation process" which

2.1

  - On this base, Starts its cycle with the 'absorption of the Regulations' at regional level, i.e. when regional actors start developing their strategies and priorities on this base

  - Continues with engaging the stakeholders and ensuring the necessary content and methodological input in the strategy processes, in particular building on the evaluation of previous policies and their impact

  - Develops true (cf. the definition) RIS3 and effective implementation actions with clear roadmaps in national and regional policy tools (funding and legal/administrative) as well as in the relevant OPs (ESF, EAFRD, ERDF incl. ETC), which are then transformed in OP proposals to the Commission

  - Arrives at the agreed OPs in respectful, evidence-based negotiations

  - Follows up, in a true shared-management approach, to mid-term review and input to the Regulations' negotiations for the next phase.

On this base:

  - Improve process design, increase stability and reliability

  - Identify all actors involved as well as their specific needs for developing strategic and methodological competences, and for understanding the specifics of R&I policy design and implementation

- Develop targeted competency building measures – for the broad spectrum of actors in the regions, the Member States, and the EU organisations. (What the S3 Platform offers is important (see below), but covers so far only part of the necessary competence building).

Recommendations to public authorities involved in the RIS3 implementation

- For those regions/ Member States that haven't finalised their RIS3:
  - Take appropriate advantage of the broad spectrum of support offered, as well as of experiences where the RIS3 – and other EU-related strategy processes – have been completed successfully
  - Ensure that the "Entrepreneurial Discovery Process" (EDP) doesn't become either a tick-the-box or a myopic exercise. Successful regional development in a globalized economy requires serious and competent forward-looking and (cross-) impact assessment activities, and for that continuous methodological guidance or advanced methodological competences going beyond the "SW" in a SWOT.
- For all regions:
  - Benefit from initiatives that take their finalised RIS3 as a base for follow-up activities (e.g. the Vanguard Initiative[3]) or for 'institutionalising' an ongoing process (e.g. the regional-national "Horizon2020 – ESIF" Synergy Platform in Germany)
  - Relate to the results of other EU-supported strategy processes, e.g. Strategic Research Agendas (SRAs) or Strategic Innovation Plans (SIPs), as support and input for their RIS3 implementation
  - Establish/strengthen cooperation with communities of other policy fields, EU2020 related programmes, governance levels etc.
  - Develop a full understanding of, and a positive approach to "Openness", invest strongly in the inter-regional/international dimension, and the opportunities from scaling-up local innovations.
- Exploit key opportunities for developing synergies between ESIF, Horizon 2020 and other EU, national and regional programmes for the purpose of increasing the impacts of the RIS3 based investments by:
  - Using technical assistance and other ESIF support mechanisms strategically: improving governance structures and administrative/management capacities (human resources, instruments), and strategic capability building throughout the system
  - Incentivising and facilitating, where appropriate, the participation of all types of regional actors in Horizon 2020 also beyond the traditional R&I and SME focused projects, e.g. in Coordinating Actions, or in the large EU P2P and P2B networks

[3] www.s3vanguardinitiative.eu

- Developing more integrated policy approaches to key policy objectives (e.g. raising the level of R&I) in social, health, or transport policies, and economic policies in general

- Broad mobilisation for participation in focused initiatives such as the "Regional Knowledge Platform" recently agreed by DG Research and Innovation and the Committee of the Regions

- Adapting R&I-proven practice and project formats from Horizon2020 in OPs (e.g. competitive calls with international peers as evaluators, 2-stage selection procedures, stage-gating of projects for SME instrument projects).

- Integrate education, research and innovation, and broad human capital agendas more strongly in RIS3. An obvious approach is learning from successfully established Knowledge-Triangle (KT) networks, such as the Knowledge and Innovation Communities (KICs) of the EIT. Participating in (parts of) the activities of their co-location centres could be a next step. In addition, explore the potential of new institutional developments bridging policy fields, e.g. the Committee of the Regions' SEDEC (Commission for Social Policy, Education, Employment, Research and Culture) and its envisaged cooperation with the Commission.
- Develop advanced strategic processes for the smart specialisation areas by
  - Adapting strategy development approaches from successful RIS3 (not only those developed in the ESIF) and/or private sector management

  - Disseminating and supporting the application of proven strategic policy and business intelligence tools.

Recommendations to the European Commission

- Maintain the support for the learning and adapting by RIS3 actors, e.g. the peer-reviews at regional level, the dissemination of experience of RIS3 based development between regions, including the (enlarged?) activities of the S3 Platform.
- Step-up the support for capability building (strategic, methodological & management), and for the participative decision approach underlying RIS3.
- Analyse how far the RIS3 process has influenced the actions, programmes and projects supported with ESI funds in terms of their objectives and intended target groups, and to which degree "Openness" has developed in its various dimensions.
- Beyond this, incentivise or support structured mutual learning between different EU bodies and the Managing Authorities, and between the Cohesion-, the rural development-, and the R&I-Policy communities. Knowledge exchange platforms could explore the rich expertise across policy domains and between regions.
- Monitor the implementation of the OPs and the policy mixes not only with respect to the agreed RIS3 priorities, but also from a strategic Europe 2020 point of view.
- Integrate smart specialization as cross-cutting paradigm of EU innovation-related policies, in particular the forth-coming revision of the Innovation Union flagship.

- Work with the Council, European Parliament, Committee of the Regions and others to be involved for longer-term structural changes aiming to better harmonise ESIF monitoring and the Semester processes.

1. INTRODUCTION

This report by a group of independent experts set up by DG Research and Innovation has set out to assess the contribution of "smart specialisation strategies" to the Europe 2020 Growth Strategy in the wider context of research and innovation policies. Smart specialisation has been highlighted by the Innovation Union Flagship[4] and the Communication "Regional Policy contributing to smart growth in Europe 2020"[5] and forms a key element of the European Commission's Cohesion Policy. A national and/or regional Research & Innovation Strategy for Smart Specialisation (RIS3) is an ex-ante conditionality for R&I investments under the European Regional Development Fund (ERDF) for the programming period 2014-2020.

Bringing together key aspects of relevant developments, programmes and policy discussions in one document, the purpose of this report is to help both with the implementation of the adopted RIS3 and, where Member States have not yet adopted their RIS3, with finalising them. The expert group's aim was to look at optimising the impact of public and private R&I investments through smart specialisation. Rather than assessing individual RIS3, which was the task of the respective official bodies, the expert group has set out to draw lessons from the broad spectrum of available strategy documents with the objective to improve future design and implementation of (regional) innovation, research and related strategies and to develop smart policy mixes at multiple governance levels.

In order to avoid duplication, the expert group builds on the many existing studies, reports and policy reviews and activities on smart specialisation. This report is complementary to assessment and review work already done by experts contracted by DG Regional and Urban Policy and the activities of the Smart Specialisation Platform (S3 Platform) of the IPTS/Joint Research Centre in Seville.

What has been unique for this expert group is that it could base its work on the submitted strategy documents prepared by European regions and Member States. This provides a first EU-28 overview of the contents of the RIS3 and their links with both national research and innovation-related policies as well as with international and cross-border policies. We have paid special attention to the relationship between the actual RIS3 and Horizon 2020 and their potential synergies. Again we build on earlier work on the question of synergy between, in particular, the European Structural und Investment Funds (ESIF) and Horizon 2020. An important aspect is whether multi-level governance (MLG) has been strengthened, e.g. how the integration between regional, national and EU strategies is embedded in RIS3 or the other documents accepted by the Commission as fulfilling the ex-ante conditionality.

The expert group's work has been hampered by the fact that the submission of RIS3 to the Commission by regions and Member States was far from complete at the time of finishing this report, in part due to the delayed adoption of the regulatory framework for Cohesion 2014-2020 (end 2013). By January 2015, 17 Member States have submitted strategies, some of which consisted of existing national or

[4] COM(2010)546 of 06/10/2010

[5] COM (2010)553 of 06/10/2010

regional R&I strategies as allowed by the cohesion regulations. Equally allowed[6], other Member States have opted to submit an Action Plan, i.e. a plan that describes how and when they will deliver their full RIS3 documents in 2015/2016. This delay had the consequence that the expert group could not assess a fully representative set of the RIS3 in the EU-28. In particular, the R&I strategy sample that the group has been able to review has a stronger representation of more advanced Member States. To look at it from the positive side: the lessons from the assessment of the already submitted RIS3 can be used by those regions still in the process of completing their strategy exercises. In addition, the development of a RIS3 is not a static one-off exercise, and all regions will be updating and revising their RIS3 in the course of the programming period 2014-2020.

1.1. Our work method

The first task of the expert group has been to synthesise existing reports and material in order to assess the overall context in which smart specialisation will be implemented. We have focused on connections with Horizon 2020, and on topics such as R&I internationalisation, research infrastructures, the grand societal challenges and the role of SMEs. We outline other EU funding programmes where synergies with RIS3 could be leveraged, and emphasise the relevance of EU-MS level cooperation in the European and National Semester processes and of relating the Country-Specific Recommendations (CSR) and ESIF. The second task of the expert group was to review a sample of formally submitted RIS3 and other relevant documents from all 28 Member States: national strategies of smaller countries that have submitted one integrated strategy, and for the larger countries we have made a selection of two regional strategies. For those countries and/or regions that had not submitted a RIS3 before October 2014, the latest date possible for us to start an in-depth assessment, we have looked at other available documentation such as the Operational Programmes, or material available in the regions or through the S3 Platform.

The results have been synthesised, and key observations described. We have drawn general conclusions regarding the state of play across all EU Member States at the beginning of 2015, i.e. at a time when the implementation of these RIS3 is only in the starting phase.

1.2. The structure of the report

The following chapter 2 places the smart specialisation approach in a wider Europe 2020 context. RIS3 and the ESI funds form only one pillar that supports smart growth and a knowledge based economy in the EU. The chapter argues that the potential of the spectrum of linkages to this wider context should be more systematically and pro-actively explored. Chapter 3 looks closer at the relationships and potential synergies between RIS3 and Horizon 2020 from different perspectives. Chapter 4 summarises the observations that the expert group arrived at from the review of the sample of RIS3 or substitute documents. Finally, chapter 5 presents the conclusions from the group's work, and provides a set of recommendations addressed to the different stakeholders involved in the ongoing RIS3 processes, and also regarding the implementation of R&I-related policies more generally.

[6] Article 19 (2) of the 'Common Provisions Regulation' (1303/2013)

2. THE WIDER CONTEXT: SETTING THE FRAME

2.1. Key Points from this chapter:

Key Points
• The Smart Specialisation Strategy (S3) approach has been in place in quite a number of European regions and elsewhere, even before this became the 'official' framework for the preparation of Cohesion Policies. The lessons from these early experiences and proven strategic planning processes should be disseminated across all European regions, and adapted to local circumstances (section 2.2). • In general, it is vital for all types of regions to position local innovation eco-systems optimally in global value chains and aim, to the extent this is realistically achievable, for success in world markets. • The persisting gap between European regions in terms of R&I performance provides a strong argument for adequate place based strategies that take a different direction compared to previous generations of Cohesion Policies. For most regions doing more of the same is not sufficient to achieve structural economic change (section 2.4). • While the focus of attention of RIS3 is on the effective use of public investment, and on stimulating synergistic private investment in R&I, as one of the priorities of the European Regional Development Fund (ERDF), this investment is only one component of a much wider set of regional, national and European policy programmes and instruments, that aims to achieve related smart growth goals. Linking RIS3 policies with other policies supporting the Europe 2020 objectives at regional, national and European levels would increase their impact. This alignment needs a better harmonisation of strategic policy intelligence tools early in the policy formulation process. This is not yet sufficiently done (sections 2.2 and 2.3). • Developing a true RIS3 requires a broad view of innovation. The policy strategy process involved should reach beyond R&D policy, addressing also the role of (higher) education, science, technology, entrepreneurship, FDI and especially human resource policies in fostering structural change.

2.2. Smart Specialisation – a Research and Innovation (and Education) policy approach

2.2.1. Smart Specialisation in general - key elements, supporting policies

Smart Specialisation has been a success strategy for developed, internationally well connected and export-oriented regions, long before the academic discussion started a few years ago, or before the political decision was taken to apply this policy approach to the ESIF 2014-2020. The reason is that for maintaining or creating sustainable jobs in competitive globalised markets, and the quality of life in the regions, it has become vital to position local innovation eco-systems optimally in global value chains, and aim for success on world markets.

In essence, from a practitioner's point of view, successful Research & Innovation Strategies for Smart Specialisation (RIS3) are based on a set of competences enabling the design of processes, which are:

- More strategic and better informed
- Outward looking & linking
- More forward looking & 'pro-acting'
- Characterised by broad stakeholder involvement (more than the "usual suspects" and "rent seekers")
- Better linking policy areas and governance-levels

Focusing investments on (new combinations of) regional strengths and potential, preferably in fields with a high potential to address societal challenges (e.g. KETs – Key Enabling Technologies or GPTs – General Purpose Technologies).

Supporting the development and implementation of RIS3 provides an important rationale for Research, Innovation (and Education) policies at all governance levels and aims to

- Promote efficient & synergetic use of public and private resources
- Increase return on investments and improve societal impacts.

However, operationalising effective RIS3 support, guiding and incentivising innovation actors in this endeavour presents considerable challenges. Traditional policy mixes strengthening innovation (in a broad sense) have to be profoundly adapted to today's complex innovation arenas and processes, with actors connected internationally by dynamically evolving value chains.

Bottom-up driving forces should play an important role, and RIS3 will demonstrate value only if capable innovation actors plan strategically and invest accordingly. On the other hand, policymakers tend to focus on the macro-level effectiveness of their investments. To balance the macro level and the individual actors' interests, a combination of strategic innovation framework setting with bottom-up strategic activities has to be developed, that is focused on the specifics of the innovation eco-system addressed. Strategic Policy and Business Intelligence methodology and tools (such as foresight, impact assessment, roadmapping, monitoring and evaluation) play a key role in finding the best strategic line from a macro perspective, while also supporting 'informed flexibility' for optimising localised applications.

In regions with highly developed innovation systems, and successfully positioned in key global value chains, the Smart Specialisation approach, as mentioned above, is often an inherent one (cf. the "Baden-Württemberg case" below). Supporting policies can put their focus on adapting framework conditions and capability building measures, on strengthening multi-governance-level and cooperation across policy fields, on rethinking Knowledge-Triangle[7] and Quadruple-Helix[8] relationships,

[7] A term used to indicate close, effective links between education, research and innovation

redrafting roles and transferring not only funds, but also responsibilities to the empowered actors in their territories.

Figure 1 MicroTEC Südwest: a non-ESIF-related RIS3 case from Baden-Württemberg

RIS3 Case Baden-Württemberg

This regional case was neither called "RIS3" nor were ESI funds involved, it was the 'Unique Selling Point' to win € 40 million national, and € 5 million regional funds in the prestigious German "Spitzen"-cluster competition. The MicroTEC Südwest consortium followed the RIS3 'philosophy', and included key RIS3 elements:

Focusing investment on own strengths in fields with a high potential to address societal challenges:

Microsystems Technologies (MST) as a General Purpose Technology enables intelligent, resource- and cost-reducing applications, for energy-saving, resource-efficient production, healthy ageing, secure societies, key infrastructures, etc., and thus can boost economic development in practically all markets and sectors.
Baden-Württemberg (BW) is one of the global MST centres, and its 1.500 MST-related enterprises are embedded in BW's "relational" innovation system in multiple ways, AND integrated in key global value chains.

- **Involving stakeholders, public-private policy experimentation to upgrade the innovation eco-system & multi-level governance:**
  Drawing on this MST innovation system, the MicroTEC Südwest consortium includes more than 250 MST-related entities located in an area of about 5 million population, covering the whole spectrum of *knowledge generation* (research in universities and enterprises, education and (re)training), and *industrial knowledge transformation and exploitation* (technological solutions, innovative products and business models). To profit from national (€ 40 million) and regional (€ 5 million) R&I support, consortium members invested more than € 40 million of own funds, and additional resources of their EU projects – mostly in R&I but also in education & training and 'Structural Projects'.
  One of the Structural Projects developed the 'RIS3' in a 'guided entrepreneurial discovery process' involving 130 participants from academia, industry, government/administration and funding agencies to develop promising investment plans and identify funding options, ensure sustainable progress by 'upgrading the system' through an integrated 'learning process'. Public and private decision-makers built their capabilities to develop future strategies themselves, assess them from a broad range of perspectives, and

[8] A term used to describe a paradigm where government, industry, academia and civil participants work together to co-create the future and drive structural changes far beyond the scope of what any one organization or person could do alone.

develop actor-specific, synergistic approaches to less risky longer-term R&I&E investments.

Strategic outward and forward looking, monitoring: (see next figure on MicroTec Südwest Policy Cycle)

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Informed by the EU-wide Strategic Research Agenda (SRA) of *EPOSS (European Technology Platform on Smart Systems Integration)*, considering a broad range of foresight exercises worldwide, and focused on the priority fields of the German *Hightech Strategy 2020*, a strategy team guided the stakeholders through a "**Strategic Learning Cycle**"

Supporting them to optimise development paths, and create commitment for joint activities. Applying a combination of Strategic Policy Intelligence tools, this strategy cycle included:

- Inward (auditing) and outward-looking (international benchmarking)
- Forward-looking (foresight)
- Agenda/priority setting (techn. & innov. assessment, ex-ante evaluation)
- Action planning (roadmapping)
- Action-taking/mobilising sustainably public and private resources

- In parallel, an "Operational Learning Cycle" was established to monitor the implementation of the ongoing projects, ensuring that their results lead to the desired progress and positively influenced the ongoing overall strategy process.

The situation in less developed regions is different: there, many facets of the governance relations within the innovation systems still have to evolve, especially regarding public-private partnerships and balancing top-down and bottom-up dimensions. The RIS3 approach, with its strong emphasis on the governance processes that underpin innovation strategy development, is crucial for regions and Member States with innovation systems that do not yet have the depth and breadth of the highly developed systems. It is not only about raising R&I activities of different stakeholders, it is also about improving the processes between public, and between public and private, stakeholders to create a more agile innovation eco-system.

The Sixth Report on economic, social and territorial cohesion provides a good overview of how R&D remains spatially concentrated.[9] Furthermore, the available data suggest that a very small number of industries are responsible for a vast majority of the business R&D investment globally.[10] Mastering the key emerging technologies and nurturing R&D intensive industries remains crucial for all regions in Europe. As a general message, the Report identifies good governance as a key for economic and social development.

2.2.2. The Smart Specialisation concept in the Europe 2020 context, structural alignment of Cohesion Policy

Adapting and operationalising the concept

While strongly advocating the importance of place-based policies, the Barca report (2009, at the request of the Commissioner for Regional Policy),[11] stressed the need to increase the impact of the Cohesion Policy investments.

> *Cohesion policy provides the appropriate basis for implementing this [place-based development] strategy, but a comprehensive reform is needed if present challenges are to be met… the reform requires the adoption of a strong policy concept (renewing the original ideas of EU founding fathers), a concentration of priorities, key changes to the governance, a new high-level political compromise and an appropriate adjustment of the negotiation process on the budget.*

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9 European Commission, Investment for Jobs and Growth, Promoting development and good governance in EU regions and cities, Sixth Report on Economic, Social and Territorial Cohesion, July 2014.

10 Moncada-Paternò-Castello, P., Ciupagea, C., Smith, K., Tübke, A. "Does Europe Perform too Little Corporate R&D? A Comparison of EU and non-EU Corporate R&D Performance." *Research Policy* 39, 523-536, 2010.

11 Barca, Fabrizio; *An Agenda for a Reformed Cohesion Policy*, A place based approach to meeting European Union challenges and expectations, Independent Report at the request of Danuta Hübner, Commissioner for Regional Policy, April 2009.

Later in the same year, the *Knowledge for Growth* expert group advising the Commissioner for Research, published a policy brief[12] to "invigorate the policy discussion", and, i.e., "outline the role for governmental S&T policies" in S3.

In the context of the Europe 2020 policy discussions this has been taken up, and as one consequence of the Cohesion Policy negotiations, political pressures developed to spend huge financial resources following the Smart Specialisation approach. RIS3 have become one pre-conditionality for implementing the more than € 450 billion ESIF investments[13] and the national/regional co-funding in the 2014-2020 Programming Period, as part of the Cohesion Policy's contribution to the Europe 2020 Growth Strategy. More specifically, the RIS3 ex-ante conditionality relates to the Thematic Objectives 1 (R&I target) and 2 (ICT target) of the ERDF.

The general policy rationale for supporting Smart Specialisation (i.e. increasing return on synergistic public and private investments as well as societal impacts in view of the global value chains relevant to the territory) was adapted to Cohesion Policy with the following specific foci:

- Strengthening Cohesion
- Harnessing regional diversity by combining top-down goal-setting with a structured (and if necessary guided) bottom-up "entrepreneurial process" involving key stakeholders.

RIS3, in this context, involve processes of:

- Developing a vision based on own strengths and development potential
- Identifying competitive advantage in an international context
- Setting strategic priorities
- Making use of a policy mix and focusing resources to harness the potential of any region to the full.

To operationalise the concept in EU Cohesion Policies, RIS3 are defined[14] as integrated, place-based economic transformation agendas, which:

- Focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development
- Build on each territory's strengths, competitive advantages, excellence potential
- Support all types of innovations, and aim to stimulate private sector investment

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[12] Foray, D., David, P.A., Hall, B. *Smart Specialisation – The Concept.* Knowledge Economists Policy Brief n° 9, 2009

[13] Incl. approx. € 352 bn (ERDF + ESF + Cohesion Fund) + € 96 bn EAFRD + 6 bn EMFF.

[14] Guide on Research and Innovation Strategies for Smart Specialisation (RIS3 Guide), 2012.

- Get stakeholders fully involved and encourage innovation and experimentation
- Are evidence-based and include sound monitoring and evaluation systems.

As a support for regional actors to cope with the new requirements, and concretise Europe 2020 contributions through their regional development activities, the S3-Platform was established in the Institute for Prospective Technological Studies of DG Joint Research Centre (IPTS/JRC) in Seville offering a broad spectrum of support tools and activities.[15]

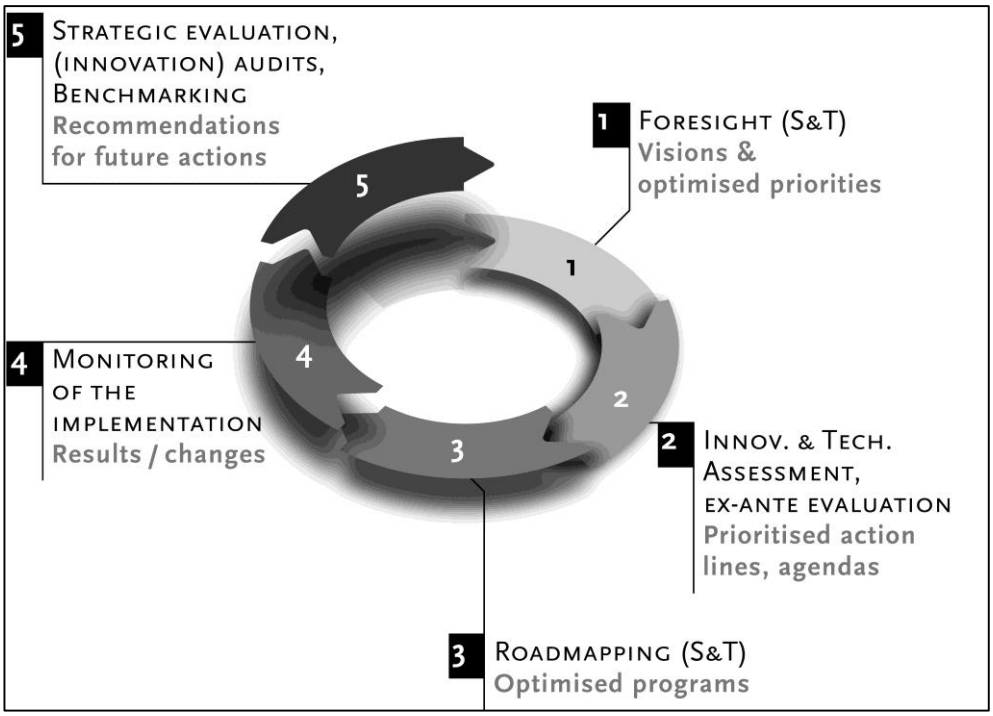
Structural alignment of Cohesion Policies for realising the EU 2020 contributions

To facilitate or enable effective alignment with other EU and national policies and prioritised R&I areas, a better harmonisation of strategic policy intelligence tools early in the policy formulation process is key, when long-term perspectives are developed, and strategies and roadmaps discussed and decided. In this regard, the S3-Platform designed a six-step process for RIS3 development, which, taking into consideration the specifics of EU Cohesion Policy, follows in principle a typical policy cycle such as the one outlined in Fig. 2 below.

Thus, for the first time, a Cohesion Policy tool uses Strategic Policy Intelligence elements in many ways similar to those used in the main R&I programmes of the EU, where, e.g., large public-public (P2P) or public-private (P2B) consortia developed their Strategic Research Agendas (SRA), Strategic Innovation Agendas (SIA) or Strategic Implementation Plans (SIP). So far, this is not fully exploited as a facilitation factor for structural, highly beneficial synergies with the potential of mobilising considerable resources for effective and efficient initiatives.

[15] http://s3platform.jrc.ec.europa.eu/home

Figure 2 A typified R&I cycle: its strategic policy intelligence tools, and related main results.



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2.3. The Europe 2020 Growth Strategy - EU and national dimensions

The Europe 2020 Growth Strategy was established in 2010 as a reaction to the 2009 crises, and also to address the shortcomings of current growth models in general, and deficiencies of the Lisbon Strategy (i.a. strongly supply-side, no clear European policy-mix focus) in particular. It aims at boosting "smarter, more sustainable, and more inclusive growth", and creating rewarding (in more than one sense) jobs in this context. It focuses on a deeper coordination of Member States' and European policies, and aims at stable, long-term trans-governance-level and trans-border partnerships including industry, academia, government, administrative bodies and civil society. This requires, i.a., new governance structures and processes linking the EU-and the national/regional levels, as in the annual cycles of economic and structural policy coordination of the European (and National) Semesters (see below).

2.3.1. The headline targets, the Flagship Initiatives, and RIS3 in this context

Figure 3: shows the five headline targets for the whole of the EU. Each of those EU targets has been transformed by the MS into their own national targets.

Figure 3 The five EU-wide headline targets

Concretising the directions to take – the five headline targets for the EU

- Raising the employment rate of the 20-64-age group from the current 69% to 75%
- Achieving the Barcelona target of 3% GERD/GDP, i.a. by improving the conditions for and mobilising the private sector and developing a new indicator to track innovation
- Reducing greenhouse gas emissions by 20%, increasing the renewable energy share in final energy consumption to 20%, and achieving a 20% increase in energy efficiency
- Reducing the 15 % share of early school leavers to 10%, and increasing the 30% of the 30-34-age group having completed tertiary education to 40%
- Reducing the number of Europeans living below national poverty lines by 25%, i.e. 20 mill people.

Seven Flagship Initiatives provide the framework through which the EU as well as national/regional authorities mutually reinforce their efforts in areas supporting the Europe 2020 priorities[16]:

Smart Growth:

- Innovation Union: improving R&I framework conditions and access to finance, and strengthening the whole innovation chain and boosting related investments.
- Youth on the move: enhancing education systems' performance, and reinforcing the international attractiveness of Europe's higher education.
- Digital agenda for Europe: speeding up the roll-out of high-speed internet and reaping the benefits of a digital single market for households and firms.

[16] http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/flagship-initiatives/index_en.htm

Sustainable Growth:

- Resource efficient Europe: decoupling economic growth from resource use, decarbonising the economy, modernising the transport sector and promoting energy efficiency

- Industrial policy for the globalisation era: improving the business environment and supporting the development of a globally competitive, sustainable industrial base

Inclusive Growth:

- Agenda for new skills and jobs: modernising labour markets, facilitating mobility and lifelong skills development, increasing labour participation, better matching labour supply and demand

- European platform against poverty: ensuring social and territorial cohesion to share the benefits of growth and jobs, and make possible, for a larger share of the population, a life in dignity and an active part in society.

RIS3 and the Flagship Initiatives

Although RIS3 have been defined within the frame of R&I policies, and are seen as vehicles for a more effective Cohesion policy, their potential reach and their link to other policy domains is much larger.

Indeed successful transformation of regional economies around key strengths would require more than improving R&I framework conditions and raising R&D intensities. The first direct link to other EU2020 components is the Agenda for new skills and jobs and the enhancement of Europe's education systems: the main vehicle to reinforce competitiveness is the quality of European human capital. The other obvious link is with the Sustainable Growth agenda: to contribute to this wide goal, European regions and Member States have to develop better conditions for their industrial base and link instruments from R&I domains to those of the industrial policy domain.

RIS3 in line with the Innovation Union Flagship Initiatives should have considerations regarding the creation of regional competitive advantage based on the integration of ICT tools in the economy, better resource efficiency in enterprises and investment in advanced manufacturing and human resources. The development and adoption of new technologies, models and experiments to increase sustainability in for instance the fields of transport and energy, fit perfectly with the RIS3 ambitions and make a significant contribution to EU 2020 goals.

2.3.2. EU programmes with RIS3 synergy potential (other than Horizon 2020)

RIS3 provides an excellent opportunity to link regional and national policy mixes with other European programmes and financial instruments.

The recently introduced Investment Plan for Europe from Commission President Juncker which aims to mobilise €315 billion to increase the investments in (innovative) infrastructure, could potentially provide leverage to R&I investment

plans in Member States and regions. (Further details published after the time of writing this report.)

Less known is that there are various other funding programmes, either related to a Flagship Initiative or of a more cross-cutting nature, which can be used to complement ESIF investments and increase their impacts (see Figure 4**Error! eference source not found.**). Synergetic use, however, is not straightforward, because most are, as Horizon 2020, implemented in time cycles different from Cohesion Policy, centrally managed and allocated through 'open' calls.

Nevertheless, these other programmes could be used to reinforce the human capital agenda and skills development, to address societal challenges, to improve ICT connectivity, or to support the cross-border dimension of policies.

In reality, we see that many regional authorities dealing with the ERDF funds do not even refer to these other programmes in their RIS3 strategies or in their implementation plans.

Figure 4 Other EU Funding Programmes

Other EU Funding Programmes that can be connected to RIS3 strategies

3.1 EaSI, the financing instrument for Employment and Social Innovation, promotes employment and social policies (PROGRESS programme), job mobility (EURES) and access to micro-finance and social entrepreneurship.

4.1 Connecting Europe Facility (CEF) to push Broadband infrastructure and services, to promote cleaner transport modes, and to facilitate the use of renewable energy.

5.1 LIFE, the financial instrument for developing EU environmental and climate policy and legislation; contracts and grants for the Climate Action

6.1 EU Health Programme, aiming at protection of human health as part of all EU policies in cooperation with MS.

7.1 Creative Europe supporting the cultural and creative sectors especially by opening up new international opportunities, markets and audiences

8.1 COSME, supporting the Competitiveness of Enterprises.

9.1 Erasmus+, supporting education, training, youth and sport initiatives, and related policy reforms.

10.1 European Neighbourhood Instrument (ENI) Programmes aiming to promote enhanced political cooperation and progressive economic integration between the EU and partner countries, and the implementation of partnership & cooperation agreements, and of joint action plans.

11.1 External Policy Programmes.

2.3.3. Monitoring progress, and guiding and involving Member States - the European and National Semesters

The two-phase annual cycle of macro-economic, budgetary and structural policy coordination called the European (and National) Semester involves EU level policy guidance by the European Commission and the Council and reform commitments by the MS. It ensures that MS discuss their budgetary and economic plans with their EU partners at specific times throughout the year, and repeated every year. In the first phase, considering the EU-wide Annual Growth Survey, the Alert Mechanism Report, and the MS' National Reform Programmes (NRP), the European Commission analyses the reform policies of the MS, and provides Country-Specific Recommendations (CSR). In the second phase, the recommendations endorsed by national leaders in the European Council, are taken on board in the policies and budgets of the Member States.

This process, continuously adapting policy recommendations to the changing realities, appears disconnected with Cohesion Policy procedures, where RIS3 have been examined and negotiations between MS and EU are concentrated at the start of the period 2014-2020. Formally, when Operational Programmes are adopted, there is little possibility for further interaction until the end of the period[17]. Hence, in the current situation, the above Semester mechanisms can only indirectly provide a possibility for such interactions: a missed opportunity to reinforce the contribution of RIS3 to EU 2020 goals.

2.3.4. The Europe 2020 objectives - state of play, and need for further action

In its mid-term review of Europe 2020 in 2014, the Commission sees the EU progressing towards meeting the education, energy and climate change targets (cf. Figure 3), but this is not the case for the employment, research and development, and poverty reduction targets. The most recent data confirm mostly this situation[18]. Following the same line, the Sixth Report on Economic, Social, and Territorial Cohesion (2014) highlights that regional disparities have widened in many countries, and that it will require substantial efforts to achieve the Europe 2020 targets in a context of significant budgetary constraints.

Such efforts are necessary at both the EU and national/regional levels: at the EU level, for example, further decisions have to be taken to complete the single market in services, energy and digital products, and to invest in (EU-internal and external) cross-border activities. At national/regional levels many obstacles to competition and job creation have to be overcome for more impact on growth and jobs of the resources invested. Here, clearly, RIS3 come into play.

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[17] Although Article 23 of the Common Provisions Regulations can require a MS to amend its programmes to take account of the Semester and the Country-specific Recommendations (CSR)

[18] Eurostat, March 2015, http://ec.europa.eu/eurostat/documents/2995521/6664132/1-02032015-CP-EN.pdf

The need for action has also been underlined by different representative organisations and bodies, e.g. in the Athens Declaration of the Committee of the Regions (2014), or, based on this, the "Blueprint for a revised Europe 2020 strategy" by the Steering Committee of the Europe 2020 Monitoring Platform (2014).

2.4. A persistent gap in Research and Innovation Capabilities between the EU regions

The Europe 2020 strategy has taken up the Barcelona target of the Lisbon Strategy to increase average Gross Expenditure on R&D in the EU to 3% of GDP by 2020. The reality is that a few Member States and regions invest into R&D much more than 3% of their GDP, while the comparative figure is barely 0.5% in less developed Member States. This strong dichotomy in terms of R&D intensity of the economy between the different Member States in the EU is an important indication of a need for structural change.

R&D intensity is not uniform across sectors. A fairly small number of industries such as information and communication technologies (ICT), biopharmaceuticals and automotive manufacturing are, in fact, responsible for 2/3 of the global industrial R&D investment[19], and also, together with knowledge-intensive services, for a substantial share of industrial employment and value added in the more advanced European economies. Resource and labour intensive industries, where R&D intensity is low, tend to dominate the scene in less developed economies[20]. The level of industrial R&D investment in an economy has, thereby, largely to do with its actual industrial specialisation pattern.

The nature of innovation that drives economic growth is also very different in the aforementioned two groups of economic regions along with the structure of the industry. While the more advanced regions are able to innovate at the cutting edge of science and technology, much more basic learning by doing and adoption of technology developed elsewhere remain predominant sources of economic growth in less developed regions[21]. More often than not, the latter are characterised by insufficient supply of research and engineering staff and low quality of the public research base. Industry tends to lack specialised R&D units in less developed countries as they specialise in economic activities that do not presuppose R&D. Consequently, industry often finds innovation policy that focuses on R&D that is irrelevant for their purposes.

Small less developed regions in Europe find themselves in a particularly difficult situation in devising their industrial strategy. For them it is not feasible to cover the

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19 Moncada-Paternò-Castello *et al* 2010, cf. [10]

20 Eurostat. Statistics Database. http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

21 Lundvall, B.-A., Borrás, S., The Globalising Learning Economy. European Commission, December 1997; Lundvall, B.-A. et al (eds). Handbook of Innovation Systems and Developing Countries: Building Domestic Capabilities in a Global Setting. Cheltenham: Edward Elgar, 2009

whole spectrum of cutting-edge science and technology that is needed for nurturing indigenously new key emerging technologies. The extreme concentration of resources required for the establishment of a new high-tech industry is a risky strategy[22]. Yet, small economies are also unable to compete with the larger emerging economies in scale-intensive mass production. This is why adequate understanding of the key developments in global science and technology, and industrial specialisation is so important for small less developed economies[23].

Furthermore, there is a crucial role for public research, but the direct role of R&D in economic growth is dwarfed in the less developed regions given the dominance of low and medium technology industries in their economic specialisation. High quality public research is of paramount importance in sustaining and increasing the quality of higher education in the less developed regions. Ultimately, science and technology intensive industries can emerge only in these less developed regions that have – and maintain – a sufficient supply of adequately trained workers.

The differences in the innovation performance between EU Member States are also visible through the relatively low participation of in particular "new" EU Member States in the European Research programmes (see also Chapter 3).[24] RIS3 could be expected to include mechanisms and incentives to reinforce this participation, a key to increase the international linkages of actors in the R&I community.

The RIS3 pre-conditionality – having a RIS3 (or existing similar national or regional strategy) in place in order to be eligible for ERDF support for innovation-related measures – applies specifically to two ERDF thematic objectives:

- Strengthening research, technological development and innovation (R&I target)
- Enhancing access to, and use and quality of ICT (ICT target).

This misses, however, the crucial role of (higher) education and foreign direct investments in fostering a major structural change in the industry of the less developed regions, which the 3% R&D intensity target of the Europe 2020 strategy implicitly calls for. A well-developed RIS3 would need to pay sufficient attention to these two mechanisms to augment R&I capabilities.

Furthermore, there appears to be a conceptual tension between the Europe 2020 strategy that calls implicitly for major structural change that would allow for

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[22] Example: Nokia's R&D investments alone reached 1% of the GDP of Finland in early 2000s, when Nokia was the dominant player in the telecommunications equipment manufacturing area. Yet, it proved still insufficient to be able to stay ahead in global competition.

[23] Walsh, V. Competitiveness of Small Countries. In: Freeman, C. Lundvall, B.-A. (eds). Small Countries Facing the Technological Revolution. London and New York: Pinter, 37-66, 1988; Tiits, M., Kalvet, T. Intelligent Piggybacking: A foresight policy tool for small catching-up economies. International Journal of Foresight and Innovation Policy, 9 (2/3/4), 253-268, 2013

[24] See for instance Schuch K. (2014) Participation of the 'New' EU Member States in the European Research Programmes — A Long Way to Go. Foresight-Russia, vol. 8, no 3, pp. 6–17.

boosting industrial R&D investment, and the various smart specialisation concept papers that advocate that the smart specialisation strategies of the less developed regions should focus on their existing industrial strength, thus taking gradual steps for change, rather than try to build up novel high-tech industry.[25] We can clearly observe this dilemma in a number of the available RIS3.

The RIS3 concept expects that the very best R&D ideas and priorities to be supported in the context of the smart specialisation strategy will emerge in the course of an "Entrepreneurial Discovery Process" (EDP). The problem with less developed regions is that the research intensive industry is weak in these economies, and relevant stakeholders tend to have, thereby, also a weaker influence on economic policy than entrepreneurs active in more R&D intensive industries. Any preparation of a regional innovation strategy that focuses predominantly on R&D finds a considerable share of its entrepreneurs marginalised.

The conclusion from the above is that especially a RIS3 strategy in a less developed region must not deal solely with science-based innovation. It has to take a much broader view of innovation. The policy strategy process it brings about has to reach beyond R&D policy, addressing also the role of (higher) education, science, technology, entrepreneurship, FDI and especially human resource policies in fostering structural change in the industrial base of less developed regions. Such a broader approach makes the whole smart specialisation strategy much more relevant to economic development in less developed regions, and also much more attractive for a broader group of academics, entrepreneurs and policy makers.

2.5. Refocusing EU Cohesion Policies on the Europe 2020 targets and structural reform: a fundamental new direction

According to all official statements, the EU Cohesion Policy 2014-2020 should take a "fundamental new direction" concentrating on investments that stimulate the economy, on contributions that address the EU 2020 goals related to growth and jobs, climate change, energy dependence and social exclusion.

Guidelines (for overall approx. € 500 bn EU and MS investments) and decisions for implementing the ESIF are aimed at maximising the impact of these, and other related EU investments. Research and Innovation is the first of four key priorities of the European Regional Development Fund (ERDF), and regions are obliged to allocate a considerable part of the available funding to these priorities.

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[25] Marek Tiits, Tarmo Kalvet and Imre Mürk, „Smart specialisation in cohesion economies", Journal of the Knowledge Economy, forthcoming in 2015, DOI: 10.1007/s13132-015-0239-6; Foray et al. 2009[12]; Foray, D., David, P., Hall, B. *Smart Specialisation: From academic idea to political instrument, the surprising career of a concept and the difficulties involved in its implementation.* MTEI Working Paper. Lausanne: Ecole Polytechnique Federale de Lausanne. 2012

Figure 5 Four key priority areas for European Regional Develoment Fund (ERDF)

European Regional Development Fund

Less Developed Regions (LDR) should allocate 50%, Transition Regions (TR) 60%, and More Developed Regions (MDR) 80% (in total over € 100 bn) to four key priorities:

- **Research and Innovation**: advisory and support services, infrastructure, equipment, pilot product lines, advanced manufacturing, cooperation and networking activities; training of researchers, development of post-graduate courses, entrepreneurial skills
- **SME support**: access to finance, business advice including cross-border partnerships, access to global markets, mitigating entrepreneurial risk, new sources of growth, training, strengthening triple-helix relationships
- **Digital Agenda**: infrastructure, high-speed broadband, ICT tools, innovative use of ICT, Smart Cities, cultural heritage, digital literacy, e-learning, e-inclusion, e-skills, etc
- **Low-carbon economy (**at least €30 bn): renewable energies, decreasing energy use, smart energy systems, integrated approaches to policy making and implementation (minimum allocation depending on the type of region - LDR 12%, TR 15%, MDR 20%).

Source: European Commission, DG Regional and Urban Policy, 2015

DG Regional and Urban Policy has provided various forms of support to RIS3 preparation.[26] Guidelines are provided to maximise the effect of investments:

12.1 Developing concrete objectives to be achieved by the investments ("first the strategies, then the projects"), and sound monitoring and evaluation systems to measure progress

13.1 Stimulating cooperation across borders and integration in global value chains through all ERDF investments (up to 15 % extra-regional investment possible), growing importance of European Territorial Cooperation (ETC), more cross-border or macro-regional strategies like Danube and Baltic Sea

14.1 Ex-ante conditionalities: meeting conditions BEFORE funds are spent, e.g. "smart specialisation strategies" to identify particular strengths (in the international context), measures to improve public procurement systems, or, in general, ensuring coherence of Cohesion Policy with the wider EU economic governance, e.g. the

[26] See for instance RIS3 Fact Sheets and Ris3 Guidance documents: http://ec.europa.eu/regional_policy/index.cfm/en/policy/themes/research-innovation/; and the S3Platfom which provided amongst other matter peer reviews for RIS3: http://s3platform.jrc.ec.europa.eu/home.

"macro-economic conditionality" (consistence with NRPs and addressing reforms identified in the European Semester)

15.1 Encouraging more use of financial instruments for better SME support and access to finance by broadening their scope and providing incentives, e.g. higher co-financing rates: less emphasis on grants, and more on loans, guarantees and equity/venture capital.

16.1 In addition to ERDF, other ESIF instruments, national/regional funding and private investments can be used for, or seen in the context of, reinforcing the RIS3 as well:

- European Social Fund (ESF): priorities in the field of employment, e.g. through training and life-long learning, education and social inclusion, and linking to the Youth Employment Initiative
- European Agricultural Fund for Rural Development (EAFRD): actions strengthening the links between agriculture, food production and forestry, and R&I; development of the knowledge base in rural areas
- Cohesion Fund (CF): € 66 bn for priority Trans-European transport links and key environmental infrastructure projects – indirect impact by improving location and providing opportunities for procurement of innovative solutions.

A relevant general point was already made in the Innovation Union Competitiveness report 2011: in more developed Member States and regions, Structural Funds (SF) support leveraged around double the amounts in national and regional or private co-funding. Considering that in these countries SF often represented less than 4% share of the overall public R&I expenditure, the mobilisable investments through attractive and well-based RIS3 could exceed the ESIF R&I budgets substantially.

3. SMART SPECIALISATION STRATEGIES AND HORIZON 2020 IN THE WIDER INNOVATION POLICY CONTEXT

3.1. Key points from this chapter

- There are strong arguments supporting the need for more synergy between RIS3 and Horizon 2020. Various reports have identified a set of bottlenecks that explain why this is not happening in practice. While some progress has been made in the past year, not enough has been achieved in terms of aligning policy strategies across governance levels and policy domains.
- There is a large group of the EU 27 countries (without Croatia) where Structural Funds (SF) represented a significant share of their overall level of public R&I investments, while Research Framework Programme investments remained modest. Improvement of their policy formulation and implementation processes, following the RIS3 guidelines, has the potential to generate structural effects on their R&I systems, making them more successful in future R&I Framework Programmes.
- Becoming excellent in some specific activities will require strong connections with actors in other regions in countries within and outside Europe. RIS3 gives excellent opportunities to embrace openness and build connections outside the region and new accents in both ESIF and Horizon 2020 support this. This is underexploited today.
- While large public investments in Research Infrastructures seem likely candidates for joint planning and funding, aligning the scientific goals of Horizon 2020 and the socio-economic goals underlying ESIF R&I investments is often not straightforward.
- Societal challenges that need a public sector response can also be a trigger for future economic growth if the business sector, including SMEs and start-ups, are invited to contribute to the solutions. Regions should not limit themselves to launching a fragmented set of local solutions, but again seek the connections with other regions and countries to scale up solutions for societal challenges.
- Key Enabling Technologies (KETs) and ICT are key drivers for economic development. In many national and regional R&I plans, the focus is mostly on the development of the KETs themselves. More emphasis should be given to the absorptive capacity of existing firms, in particular SMEs, to take up available KETs and ICT and upgrade their position in a particular niche. Support for the related technological dimensions needs to be complemented by policies for the financial and particularly (higher) education and training aspects.
- Achieving more synergies needs better governance.

This is not the first report addressing synergies between Cohesion Policy Funds and Horizon 2020. Therefore, we first summarise in section 3.2 key points from existing reports and debates.

The following sections provide discussions on several issues related to the relationship between Horizon 2020 and RIS3. Section 3.3 highlights governance processes to optimise synergies; section 3.4 outlines the importance of openness/ internationalisation, and section 3.5 details synergy options between Horizon 2020, COSME and ESIF. Section 3.6 gives an overview on the EU reality so far, the large differences in the relative weight of the Cohesion Policy Funds and the Framework Programmes (FP7 in particular) in the overall R&I investments in the EU27, and section 3.7 focuses more generally on the particular issues of less developed regions in terms of R&I led growth. In addition, the expert group has highlighted other topics that could be expected to feature prominently in RIS3 and the OPs, such as the dual funding of *Research Infrastructures* (3.8), *Societal Challenges* as a potential growth engine (3.9), and the take up of *ICT and Key Enabling Technologies* (KETs) for industrial leadership (3.10).

For all these topics, there are potential synergies with Horizon 2020 in particular and EU policies more generally, but those need to, and could, be activated to a much larger extent than at present.

3.2. The ongoing synergy debate

Strong arguments support the need for more synergy between ESIF and Horizon 2020, e.g.:

- Raising research excellence in all parts of the Union is a prerequisite for the success of the Europe 2020 strategy. ESIF can and should be used explicitly for raising the excellence levels of lesser developed regions, and thus to reduce the still large gap between Member States and regions in terms of R&I capabilities
- Reducing fragmentation and unnecessary duplication of scarce public resources for R&I, thus optimising the impact of investments, requires better policy coordination between multiple governance levels, and also capability building for policy making. Lessons could be learned from other approaches with this objective, e.g. the Joint Programming Initiatives (JP), Public-Public Partnerships (P2P) in a broad range of areas
- A stronger integration along the Knowledge Triangle, i.e. coordinated policy support for education, R&I is needed
- A more efficient tackling of societal challenges can be achieved through mutually reinforcing, coordinated approaches.

17.1

The debate on synergy and interaction between Horizon 2020 and ESIF featured in many expert groups, policy documents and political speeches.[27] Different definitions of synergy are used in existing literature. The 2011 Synergies expert group (SEG) defines 'synergies' as the alignment of and cooperation between policy frameworks, programmes and actions allowing more and better attainment of their objectives.

[27] See for instance a recent speech by Commissioner Moedas at the Committee of the Regions: http://ec.europa.eu/commission/content/working-committee-regions-research-and-innovation_en

'Synergies' concern the effects produced by separate programmes that are indeed different but may produce additional effects by intensive coordinated interaction.[28]

The European Institute of Technologies (EIT) synergies report states that wherever synergy takes place there will be a stronger effect (or outcome) as a consequence of interaction of different entities, than would have been achieved individually.[29] In that report, synergies and complementarities are where two or more policies or programmes are working together, or jointly funded and benefit from this approach. The report differentiates between policy synergy and programme complementarity.

The largest part of the existing literature discusses the alignment with Horizon 2020 (and COSME) in terms of their content and thematic complementarities.

While on the one hand ESIF and Horizon 2020 support similar Europe 2020 goals, and in particular those of the Innovation Union, on the other hand they have different operational objectives and selection criteria for funding. The Synergies expert group (SEG) phrased this as follows: *"In the next programming period, the Common Strategic Framework for Research and Innovation (CSFRI)[30] will promote 'excellence' and the part of Common Strategic Framework for Cohesion Policy (CSFCP)[31] related to research and technological development, innovation and entrepreneurship will focus on 'capacity building'."*

A key message in most reports is that ESIF could be used to build capacities (e.g. in human resources or research infrastructures) to enable beneficiaries to access Horizon 2020 in the future (the 'stairway to excellence' concept). However, there is little questioning of the linear character of the 'stairway to excellence' notion, nor to the intrinsic innovation and economic growth goals of ESIF that might not necessarily need Horizon 2020 instruments to be achieved. Nevertheless, the need to provide user-friendly innovation eco-systems for SMEs and the role that ESIF and Horizon 2020 can jointly play to support this is a recurring theme.

A topic that appears in all previous 'synergy' reports is research infrastructures and the potential and need to align related strategies and instruments across ESIF and Horizon 2020 instruments. An earlier ITRE report has already identified overlaps in their funding mechanisms that could be arranged more efficiently and effectively.[32] The 2011 SEG reports refers to the concept of Regional Partner Facilities that can be linked to European Research Infrastructures.

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28 Expert Group DG Research and Innovation, Synergies between FP7, the CIP and the Cohesion Policy Funds, 2011

29 Analysis of Synergies fostered by the EIT in the EU Innovation Landscape, Technopolis, 2013

30 Now Horizon 2020

31 Now Annex 1 of the Common Provisions Regulation

32 Synergies between the EU 7th Research framework Programme, The Competitiveness and Innovation Framework Programme and the Structural Funds, Report for European Parliament, ITRE Committee, 2007

Another key message from most of these reports is that the starting point of creating synergy between ESIF and Horizon 2020 should be an alignment at policy strategy level. The National Reform Programmes are suggested as a common starting point. The smart specialisation strategies are obviously the most appropriate strategic framework from the ESIF perspective. The fact that most Member States and regions do not have an explicit Horizon 2020 strategy and rely on the bottom-up competition by the R&I community to succeed in that framework programme, should probably receive more attention in the synergy debate.

A major omission in the existing literature on how to make more effective use of smart specialisation strategies is the positioning of RIS3 in the wider growth-oriented policy agendas in Europe (e.g. EIB, Youth on the Move, New Skills for New Jobs) as well as the fit with the main economic strategies at Member State level. For centralised countries the alignment between RIS3 and national policies are likely to be stronger than in decentralised countries, where regions have more responsibility for their innovation policies.

An issue put forward in the existing synergies literature is the lack of a well-functioning multi-level governance system (MLG) that ensures coherence between policy and programming strategies across different European funding instruments. This would be a major explanation for the abovementioned lack of coherent policy strategies. Coordination and cooperation between EU Advisory and Programme Committees in the cohesion and R&I arenas is suggested as one solution.[33]

On the operational level existing synergy reports have put forward the need for better interoperability of the different funding regimes. Progress has been made by the Commission's publication of the 2014 Guidance for policy-makers and implementation bodies.[34] Nevertheless the mismatch at various levels with regards to timing, funding rules, selection procedures, strategy formulation and decision making still form major bottlenecks.

3.3. Governance processes and policy intelligence to increase synergies between ESIF and Horizon2020 investments

Exploiting the potential for synergies between ESIF and Horizon 2020 in the deployment of RIS3 asks for a better multi-level governance of policies to foster innovation in regions.

- **Horizontal coordination**: activating synergies requires the creation of better bridges between the key actors involved in the two EU programmes. This means notably that stakeholders in charge of developing RIS3 will need to include those actors that are at the forefront of participation in EU research programmes (not only companies and universities participating in specific transnational projects, but also key actors involved in KICs, EIPs, ETC and other Public-Private Partnerships (PPP), Horizon 2020 programme committees, National Contact Points, and actors involved in developing the National Roadmaps for research

[33] See page 22 of 2011 SEG report.

[34] Enabling synergies between European Structural and Investment Funds, Horizon 2020 and other research, innovation and competitiveness-related Union programmes, European Commission, DG Regional and Urban Policy, 2014

infrastructures linked to the ESFRI). What seems to be missing too is a close connection between authorities in charge of the mainstream ESI funds and those in charge of ETC programmes: ensuring that the latter are aligned with the mainstream funds is a necessary condition to support the international dimension in RIS3.

- **Entrepreneurial discovery process** (EDP): the nature and evolution of the participation of different regional actors in Horizon 2020 can be used as a 'signal' for an "entrepreneurial discovery" of relevant areas of specialisation. By analysing the thematic and geographic orientation of these successful partnerships reflecting research excellence and historical involvement, policy-makers can feed the (continuous) prioritisation process. This will add to the information gathered by other policy intelligence tools used by regional authorities (studies, data, consultative procedures, peer reviews, etc.).

- **Joint programming**: authorities in charge of RIS3 in one region, when they take an open perspective on their specialisation, create new opportunities to engage with authorities in other Member States, with a view to benefit from the possibility provided by Art.185, namely the development of joint public programmes with topping up from the European Union. Numerous ERA-NET projects have been carried out aiming to step up the cooperation and coordination of research activities carried out at national or regional level. While these projects tended to remain at the level of the exchange of experience rather than reach that of developing joint programming, with RIS3 the level of maturity of regional authorities could be raised to the point that the learning from ERA-NETs could be used in the development of JPIs.

- **Interregional learning**: the new Interreg C programme (Interreg Europe) reinforces the possibilities for authorities to benefit from trans-regional learning and capitalise on experiences. Policy Learning Platforms are foreseen as a new tool. With RIS3, regional authorities will be able to activate such policy intelligence sources in a more efficient way, by focusing their efforts on the smart specialisation domains, and, e.g. organise learning platforms along such domains. The S3 Platform (JRC in Seville) also offers opportunities for trans-national policy learning "on demand".

- **Monitoring and evaluation**: new indicators need to be developed at the programming stage to fine-tune the regional policy goals according to RIS3 specialisations, e.g., "policy indicators" measuring not only the inputs, outcomes, results and impacts of regional/national funds invested in knowledge-based development, but also of the specific roles played by ESI and Horizon 2020 funds. Up to now, such indicators are seldom developed, and if they exist, are often available in a fragmented manner, hampering a vision on the synergies achieved.

3.4. "Openness": an important feature of regional innovation policies and RIS3

One important potential benefit from the smart specialisation concept is to bring a more open dimension into regional policies. Under RIS3, regions should fine-tune policies around their comparative advantages, identified from a thorough assessment of the position of their productive fabric in global value chains, and not only based on inward-looking analyses. Recent studies looking at international

competitiveness of regions and their positioning in value chains have shown, e.g. that not more than 30% of regional growth can, on average, be attributed to local factors[35]. Because of globalisation of value chains, for most of the regions, a "sector" will not be the most relevant unit of specialisation, because the region will only develop assets in some parts of the value chain and be engaged in trade and cooperation for other parts of the value chain. Becoming excellent in some specific activities will require strong connections with actors in other regions in countries within and outside Europe.

However, and despite recent improvements, regional innovation policies in Europe have been so far characterised by too autarkic approaches, confined within regional boundaries, resulting in a relatively weak integration of the interregional and international[36] dimensions in these policies (OECD 2011)[37]. This diagnosis applies to all territorial spaces concerned:

- The national space (weak cross-fertilisation between regional policies, and between those policies and national policies, especially in larger countries with regions playing an active role in R&I policy)
- The intra-European cross-border space (weak cross-border regional policies[38])
- The wider intra-European space (this points towards the largely untapped role of regions in building the ERA, reaping its benefits and contributing to the reinforcement of EU-wide synergies in R&I)
- The extra-EU collaboration space[39] (while international cooperation lies mostly in the realm of Member States' prerogatives, regions do enter this field too and can benefit from external cooperation in R&I to reach their own development goals).

Hence, there are opportunities to be tapped for regional innovation policies, and for RIS3, to enhance effectiveness of policies at all those levels.

The outward looking approach to knowledge-based regional growth policies also applies to the global perspective. R&D activities in non-EU countries, especially the BRICS countries, have been expanding drastically in the last decade, and change the configuration of international value chains: it is crucial that EU actors get access to these new developments and position themselves and their sectors in these wider chains. Because of the growth in size and quality of R&D and innovation activities in

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35 Thissen, M., F. van Oort, D. Diodato and A. Ruijs (2013), Regional Competitiveness and Smart Specialization in Europe: Place-based Development in International Economic Networks, Edward Elgar.

36 In the rest of this section we will use "internationalisation" as shorthand for various degrees of openness: inter-regional (within and outside country) and international (within and outside the EU).

37 OECD (2011), *Regions and Innovation*, OECD Publishing, Paris.

38 OECD (2013), Regions and Innovation: collaborating across borders, OECD Publishing, Paris.

39 European Commission (2012), Overview of international science, technology and innovation cooperation between Member States and countries outside the EU and the development of a future monitoring mechanism, Brussels.

third countries, competition for attracting talents and investments, and capital for R&D and innovation, has widened beyond EU borders. Taking an open perspective in R&D and innovation is also a necessity at this scale.

This creates a picture of regions as nodes in larger, often global networks, rather than as self-supporting places. Such a vision has strong implications for policies in the smart specialisation age, which need to:

- Encourage regional actors (and crucially, firms and entrepreneurs) to connect and tap into knowledge sources located outside of the region, and form cooperative alliances based on the best combination of opportunities without unnecessary constraints linked to territorial location
- Be delivered according to the functional, rather than the administrative region, i.e. involving aligned, or joint actions between authorities that are responsible for different territories (within the same or different Member States) with shared development interests.

Implementing policies in line with RIS3, based on specialisation domains spanning over the region's boundaries, requires a fundamental shift in approach towards policy instruments fostering openness and internationalisation.

3.4.1. The role of EU Cohesion Policies in fostering the 'international' focus of RIS3

What are the options for regional authorities wishing to break the "inward-looking" trap in their policies, in the new context of their RIS3? What EU policies are playing a role to promote the interregional and international dimension in regional growth policies? Three strands of EU policies present a potential for synergies with the international dimension in RIS3: EU cohesion policy, EU R&I policies and EU competitiveness and SMEs policy.

We face a situation where, on the one hand (the mainstream strand of) EU Cohesion policy does reach all regions but does not specifically favour internationalisation nor the integration of an international dimension in actions funded and, on the other hand, mainstream research policy is intrinsically transnational in nature, but has a limited reach beyond the actors involved in top level research in research-intensive countries and regions.

However, there are new accents placed both in EU Cohesion and Research policies, which are also relevant for regional authorities seeking to support the openness of their RIS3, summarised in Figure 6 for each level of internationalisation. The main synergy areas for research policy are at intra-EU international level cooperation, while Cohesion policy mostly provides incentives for cross-border cooperation.

Figure 6 Programmes in EU Research and Cohesion policies presenting potential for different types of inter-regional and international openness of RIS3

	EU Cohesion Policy	EU Research policy
Inter-regional (within MS and the EU**)**	Rule whereby 15% of ESIF can be allocated outside of OPs; promotion of 'mainstream' interregional and trans-national actions; specialisation mapping across RIS3	
Cross-border (between MS)	Interreg A (the largest part of ETC funds)	
International (within EU)	Interreg B (and Interreg Europe for policy learning)	All Horizon 2020 programmes including EIT, focusing on identified societal challenges and enabling and industrial technologies Teaming, Twinning and ERA-Chairs for less advanced Member States
International (outside EU)		Full openness of Horizon 2020 to third countries (but with funding restrictions)

Under Cohesion policy three opportunities are present:

- First, alongside the mainstream funds, "European Territorial Cooperation" (ETC) funds aim at supporting regional development through transnational synergies (cross-border-Interreg A, trans-national - Interreg B and interregional Interreg Europe). ETC represents a minor part of the Cohesion policy instruments in budgetary terms (less than 3%), but has potential for leverage effects. This has so far faced limitations in internationalising regional innovation strategies, due to a variety of shortcomings (disconnection between authorities in charge of the mainstream and interregional programmes, lack of capitalisation and project-oriented approach, lack of involvement of private actors, lack of sustainability of

projects (OECD 2013)[40]). Addressing these problems, and following the examples of the regions overcoming these limitations (see examples in Chapter 4, and Figure and Figure 14), could give a strong impetus to the internationalisation of RIS3. The Eye@RIS3 mapping tool of the S3 Platform can support regions to identify other regions working on similar themes who could be potential collaboration partners.[41]

- Second, the new ESIF regulations foresee that 15% of ERDF (art. 70(2) CPR) and 3% of ESF (art. 13(2) of ESF regulation) can be allocated to actions outside the programme area, provided that this is beneficial for its development. Such a possibility has also existed in the past (on a more limited scale) but had hardly been turned into practice. Again, this is a bold opportunity for regions seeking to move towards more open regional innovation policies thanks to the new RIS3 approach.

- Third, the new ESIF regulations (art. 96(3d)) require Member States to describe their arrangements for interregional and transnational actions. It is not clear though how this element weights during the negotiations around the adoption of the OPs, but it provides another opportunity to put internationalisation at the core of the RIS3 policies.

3.4.2. The role of EU R&I Policies in fostering the international dimension in RIS3

European R&I policy has also a role to play to foster the international dimension in RIS3. Alongside the transnational nature of the majority of the Horizon 2020 programmes, new elements have been introduced:

- The EU FPs have evolved over time, to incorporate a "capacity building" function, with the aim to widen its reach beyond the islands of excellence. In FP7, the small Research Potential programme addressed specifically the capacity building in convergence regions. In the programming period 2014-2020 capacity building became a sole ESIF remit.

- Horizon 2020 took a performance approach supporting those lagging in performance to raise their excellence through the Twinning and Teaming action lines[42], in both cases involving partnerships between actors in advanced and less advanced regions.

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[40] OECD (2013), Regions and Innovation policy : cooperating across borders, OECD publishing, Paris.

[41] See http://s3platform.jrc.ec.europa.eu/map

[42] The Widening objective of H2020 also includes the ERA-Chairs programme, already mentioned above, which supports institutional changes and upgrading of public research institutions in less advanced Member States, but without the international partnership element as in Teaming and Twinning.

- Horizon 2020 also supports individual SMEs through the new "Innovation in SMEs" programme, providing funding for early stage high risk R&I to individual SMEs. A new programme "Cluster animated projects for new industrial value chains" supports SMEs indirectly by developing new cross-sectoral industrial value chains across Europe.

- International cooperation (beyond the EU and the Associated Countries) is possible and even encouraged under EU Framework programme for R&D, and with many countries the EU has established multiannual R&I agreements. 6% of FP7 participants come from third countries and the Marie Skłodowska-Curie programme funds researchers from 80 countries[43]. All components of Horizon 2020 allow participation of non-EU countries, but the possibility to receive funding depends on some conditions (from automatic funding – based on reciprocity considerations – to exclusion of this possibility). International cooperation is seen as crucial to contribute to the essential goals of the Horizon 2020 programme - strengthening the Union's excellence and attractiveness in R&I, its economic and industrial competitiveness as well as addressing societal challenges. The expected benefits from this international cooperation on knowledge-based growth and competitiveness – thus also addressing RIS3 goals – are:

    - "Creating win-win situations and cooperating on the basis of mutual benefit, accessing external sources of knowledge, attracting talent and investment to the Union, facilitating access to new and emerging markets and agreeing on common practices for conducting research and exploiting the results"
    - EU Competitiveness and SME policy (COSME) providing dedicated services for SME internationalisation: EU business centres, IPR helpdesks, Enterprise Europe Network, SME policy dialogues both bilaterally (China, Russia) and multilaterally (EU-MED, Eastern Partnership), Market Access Teams operating in 30 key export markets bringing together trade councillors, Commission and business organisations European Cluster Initiatives also supporting inter-regional and international cluster cooperation.

The above shows the potential present in either ESIF, Horizon 2020 or COSME to foster internationalisation in RIS3. The core issue is: how could these EU programmes be effectively *combined* to foster internationalisation in RIS3? How could such combination create complementarities so that synergies occur, delivering better outputs and impacts than when the sources are used separately?

With an increased orientation of Horizon 2020 towards innovation, and a growing concentration of ESIF funds on the promotion of innovation in areas of competitive excellence, new opportunities for synergies emerge (also with COSME). Broadly speaking, new opportunities for regions lie in the development of more focused (i.e. on RIS3 priority domains) international partnerships, which will enhance the capacity of regional actors to position themselves in Horizon 2020 and benefit more from ESIF (in particular within the European Territorial Cooperation programmes or the 15% of mainstream funds that can be allocated outside the borders).

[43] European Commission (2012), Enhancing and focusing EU international cooperation in research and innovation: A strategic approach, COM (2012), 497.

3.5. Synergy options between ESIF, Horizon 2020 and COSME

The two principal approaches to synergies:

First approach: sequential, as was the case already in the previous periods.

This is the spirit of the "upstream" and "downstream" frame for synergies, in which, first, ESIF funds support "upstream", the building of research infrastructure and potential, which then hopefully helps create the capacity for regional actors to climb to the level where they can team up and become winners in the competition for international projects under Horizon 2020, which can then deliver results which are "taken up" into the economy, possibly again funded "downstream" by ESIF. This can be the scenario also with the new Innovation in SME programme, where research and pilots can be funded by Horizon 2020, while ESIF could take the relay in further stages closer to commercialisation (respecting the limitation of funding for Horizon 2020 to projects up to Technology Readiness Level 8) and COSME for financing of SMEs or business and entrepreneurship support.

There are limitations to this approach: it reflects a linear view on innovation, where first research is carried out by a set of actors and then the results are translated in economic value, often by another set of actors. Even if there are successful examples of such a scenario, the reality is that such an ideal journey often breaks down at some point. Either the capacity built does not compete successfully at the level of excellence required by the EU programme, or the "industrial relay" is not found in the region to exploit research results as intended. This is, e.g., one of the critiques to the Competitiveness Poles in France, which are seen as "factories for R&D projects", which are not translated sufficiently into commercially valued innovation.

A geographical dispersion of the actors involved also does not facilitate the takeover of the last step in region-specific ("closed") Operational Programmes.

RIS3 should improve the chance of success of such a scenario. In the past, ESIF has been used to fund Research Infrastructures (RIs) that were not connected with regional productive fabric: subsequent participation in EU FP may have been a success in terms of research excellence, but such infrastructures were frequently failing to deliver the expected spillovers.

The adoption of RIS3 helps reduce the mismatch between research infrastructure investments and economic potential: a clearer identification of the place of the regional actors in a wider value chain allows for supporting research exploitation on a larger territory (using the ESIF possibilities for transnational funding and Horizon 2020 for joint transnational research).

Second approach: co-creation of innovation under a single, systemic initiative.

Using ESIF, Horizon 2020 and COSME support jointly for an integrated initiative fitting with RIS3 orientations is possible in the current period, with the legal possibility for ESIF and Horizon 2020 to fund simultaneously the same project (provided that there is no double funding of specific cost expenditures).

With RIS3, regional authorities will find new opportunities for supporting joint initiatives in specialisation domains shared by several regions, with realistic plans for economic development impact on the different regions involved. The various elements of such an international, focused and integrated initiative could be

simultaneously funded by ESIF (using either the possibility for mainstream funds to flow cross-border or Interreg funds) and by Horizon 2020 (through the joint participation in different lines of action such as JTI, PPPs, KICs, etc.). This comes in addition to the investments that each region could allocate from the OPs internally, but these investments could be done with a better understanding of their complementarity with investments made in the other partner regions.

COSME can add up on the business side thanks to, e.g., supporting networking for clusters in various regions working in similar S3 priority fields of activity. When OPs are open transnationally (art. 96(3) CPR), this will facilitate the creation of consortia to bid for Horizon 2020. When several regions identify complementarities in their specialisation areas, their respective OPs could, e.g. include the funding of a transnational network of clusters that are, on the one hand developing joint internationalisation activities (funded by ESIF) and, on the other hand developing joint R&D activities (to be proposed for funding to Horizon 2020, or become candidates for KICs partners), ensuring a cross-fertilisation between the various types of activities (commercialisation, research) within a single umbrella.

The potential for synergies of EU funds into single bold projects consisting in transnational co-creation of innovation, is under-exploited today. The adoption of RIS3 and the evolution of EU policies make it not only possible, but also highly appropriate, to incorporate such an approach in using ESIF, Horizon 2020 and COSME for knowledge-based regional development.

3.6. EU reality: varying relative contributions to R&I investments in the regions

Horizon 2020, the financial instrument to implement the Innovation Union flagship of the Europe 2020 Growth Strategy, has nearly €80 billion of EU funding available for EU R&I support in 2014 – 2020. Through its incentives, and especially its large instruments or networks (P2P - public-public and P2B - public-private) it is expected to mobilise considerably higher amounts of private investment as well as national and regional funding. Different from ESIF procedures, funds are mostly allocated to multi-country consortia, based on the outcomes of EU-wide calls.

With its emphasis on excellent science, industrial leadership and tackling societal challenges, Horizon 2020 promises more commercial breakthroughs by taking ideas from the lab to the market and is thus seen as a means to drive economic growth and create jobs. Its economic and societal impacts are strengthened and complemented by its further elements Spreading Excellence and Widening Participation**,** Science with and for Society, and the European Institute of Innovation and Technology (EIT) with its Knowledge and Innovation Communities (KICs).

The relative budgetary weight of the Framework Programmes for R&I and ESIF as a contribution to the Member States' total public R&I investments varies considerably between countries.

Error! Reference source not found.7 shows some comparative data between ountries on the EU contributions from ESIF and FP7 to their R&I investments. National budgets for R&I are not included in these figures. The first two columns show the financial contributions from FP7 and the part of the ERDF funding earmarked for R&D. The third column shows the ratio between the two. This third

column points towards three types of Member States:

Member States where FP7 (and thus most likely also Horizon 2020) has a considerably higher weight than ERDF: countries with a ratio above 2 (i.e. FP7 funding was more than twice the ERDF R&D funding) are Austria, Belgium, Denmark, Ireland, The Netherlands, Sweden and the United Kingdom

- Member States with a ratio between 2 and 1: Finland, Germany (with a large spread between the regions!), Cyprus, Luxembourg and France
- Member States in which ERDF has a considerably higher weight in EU R&I contributions, compared to their receipts from FP7 (ratios below 1): Estonia, Greece, Slovenia, Bulgaria, Romania, Spain, Portugal, Hungary, Malta, Italy, Latvia, Lithuania, Slovakia, Poland and the Czech Republic.

It is in this latter group that we should expect a relative larger impact of ERDF funding on structural changes in R&I capability.

We have also compared the multi-annual budgets against the Member States' one year GDP for 2013, merely to compare the relative dependency of countries on EU contributions to R&I investments from FP7 and ERDF. It shows a huge variation particularly regarding the dependency on ERDF in relation to R&I investments. In Latvia, Estonia, Lithuania, Czech Republic, Slovenia, Poland, Portugal, Slovakia, Hungary, and to a lesser degree Romania and Bulgaria, ERDF is a key source of funding for R&I. Particularly in these countries, a full and adequate RIS3 process and outcome to guide the public R&I investments has the potential of strong impacts on the entire innovation eco-system.

Figure 7 FP7 versus ERDF funding for R&D per country

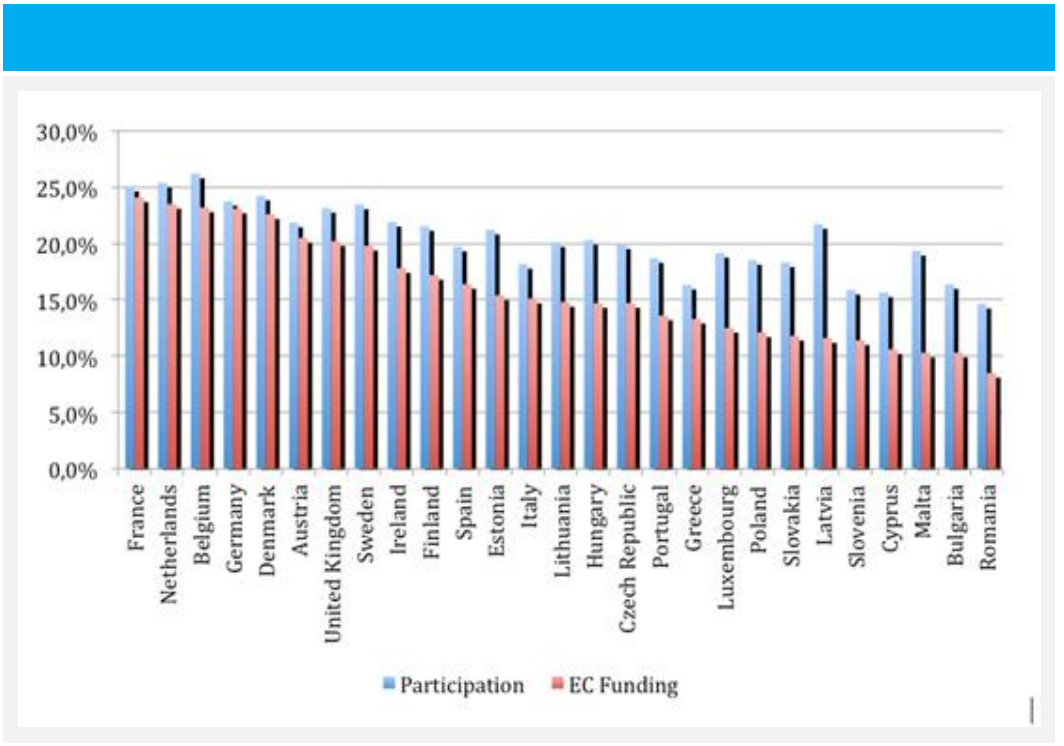
	Average annual FP7 contribution 2007-2012	Average annual ERDF earmarked budget for R&D 2007-2013	Ratio of average FP7/ERDF	GDP in market prices in 2013	Ratio average annual FP7 vs GDP 2013	Ratio average annual ERDF R&D vs GDP 2013
	mEUR	**mEUR**	**%**	**mEUR**	**%**	**%**
Estonia	11,3	93,6	12,1	18739	0,06	0,50
Latvia	4,8	106,6	4,5	23265	0,02	0,46
Lithuania	8,0	145,3	5,5	34956	0,02	0,42
Slovenia	21,8	139,1	15,7	36144	0,06	0,38
Czech Republic	33,3	522,3	6,4	157285	0,02	0,33
Poland	57,3	1225,7	4,7	395962	0,01	0,31
Portugal	62,2	505,4	12,3	171211	0,04	0,30
Hungary	36,7	295,0	12,4	100537	0,04	0,29
Slovakia	10,3	169,9	6,1	73593	0,01	0,23
Bulgaria	13,8	55,1	25,1	41048	0,03	0,13
Greece	129,0	210,6	61,3	182438	0,07	0,12
Romania	19,8	158,7	12,5	144282	0,01	0,11
Malta	2,3	8,3	28,2	7571	0,03	0,11
Spain	389,0	806,4	48,2	1049181	0,04	0,08
Cyprus	10,5	10,0	105,0	18119	0,06	0,06
Italy	463,0	865,7	53,5	1609462	0,03	0,05
Finland	122,8	66,9	183,7	201995	0,06	0,03
Germany	920,3	657,0	140,1	2809480	0,03	0,02
Austria	143,2	51,7	276,8	322595	0,04	0,02
United Kingdom	792,0	321,9	246,1	2017194	0,04	0,02
France	593,3	320,0	185,4	2113687	0,03	0,02
Sweden	211,8	57,9	366,1	436342	0,05	0,01
Belgium	230,3	45,0	511,9	395262	0,06	0,01
Ireland	70,8	19,7	359,3	174791	0,04	0,01
Denmark	128,7	22,7	566,5	252939	0,05	0,01
Netherlands	391,3	40,4	968,0	642851	0,06	0,01
Luxembourg	4,5	2,4	185,3	45288	0,01	0,01
TOTAL EU 27/year	4882,5	7101,6	68,8	13519751	0,04	0,05

Source: adapted from the Scoping Paper of the FP7 project MIRRIS (Mobilising Institutional Reforms in R&I Systems): GDP: Eurostat

3.7. Challenges for less developed regions in Horizon 2020

The participation in the EU Research Framework Programmes has been a mixed success for the European cohesion economies so far, as the Central and Eastern European countries continued to lag behind in the FP7 participation even ten years after their EU accession (see **Error! Reference source not found.**).

Figure 8 Success rates in participation in FP7 in 2007-2012 by country



Source: European Commission 2013.

Strengthening of the existing Centres of Excellence and Marie Curie actions were the key means for supporting capability building in less developed regions in FP5-FP7. Occasionally, the various thematic programmes such as the FP7 ICT programme had special actions for fostering the participation of less developed regions. This included for example dedicated networking and capability building activities, and special calls for inclusion of partners coming from the less developed regions to the already funded on-going projects. Less developed regions were also encouraged to utilise structural funds for capability building for the participation in the EU RTD Framework programmes.

Studies show, however, that the previous actions taken for fostering the participation of the less developed regions have not solved the problem. Weaker public and private R&D base of the CEE countries continues to be the main reason for their less successful participation in European R&D programmes. However, the

weakness of the participation of the cohesion economies has also to do with the very way the EU RTD framework programmes have been structured. The funding constraints have led in the FP7 often to the situation, where the Commission has been able to fund a small number or sometimes only one proposal per topic, i.e. the consortia consisting of the very best research teams in Europe. Weaker research groups have often found it very difficult to find a way into such consortia.

In the past ERDF programming period, very few regions (if any) have used the possibility offered by the regulation to support trans-regional cooperation between R&I stakeholders or to develop bilateral platforms which could have served the purpose of preparing future involvement in Horizon 2020. As mentioned above, we can also question the use of ERDF funding in the spirit of building stairways to excellence, insofar as the capacity building measures and the investments in infrastructures are done with the vision to attract the attention of international research consortia, rather than to augment intrinsic capacities.

For Horizon 2020 excellence remains the decisive criterion. Nevertheless spreading excellence and widening participation across the different European regions and Member States is necessary to prevent a widening of the gap. The relatively small part of the programme dedicated to this includes a Teaming action, Twinning, ERA Chairs, policy support facility, and networking and support (NCPs, COST).

ERA Chairs allows universities in low R&I performing countries (defined according to the value of the Composite Indicator of Research Excellence) to attract and maintain high quality human resources and introduce structural changes in the institutions, strengthening this way the synergies between Horizon 2020 and higher education policies. European less developed regions can learn from similar initiatives in more advanced European small economies, e.g. Finland or Ireland, or from emerging East Asian economies, such as Singapore[44].

One should note that, even though Horizon 2020 makes a contribution, the European Structural and Investment Funds continue to have in 2014-2020 much more resources for the strengthening of the research base of less developed regions than Horizon 2020. Capability building in science and technology in the less developed regions remains in the domain of national policies and the European regional policy rather than the European research and development policy.

3.8. Research infrastructures and the dual support from ESIF and Horizon 2020

Research infrastructures are facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields. Where relevant, they may be used beyond research, e.g. for education or public services. They include: major scientific equipment (or sets of instruments), knowledge-based resources such as collections, archives or scientific data e-infrastructures, such as data and computing systems and communication networks

[44] See: Allikad: Finland Distinguished Professor Programme, http://www.fidipro.fi, Science Foundation Ireland, http://www.sfi.ie; National Research Foundation, http://www.nrf.gov.sg.

and any other infrastructure of a unique nature essential to achieve R&I excellence. Such infrastructures may be 'single-sited', 'virtual' or 'distributed'. (Horizon 2020, Work Programme Research Infrastructures 2014-2015).

Research Infrastructures have been part of the European Framework Programmes for decades. While in the early years (1980s and 1990s) the EC emphasis was on providing international access, in later years the attention shifted to their strategic planning, the assessment of their feasibility and their construction with interested Member States who together formed the European Strategy Forum on Research Infrastructures (ESFRI). In FP7 €1.7 billion was allocated to RIs.

The Structural Funds (SF, as ESIF was called before) have funded the planning and construction of RIs particularly in the OPs 2007-2013, when the expenditure relating to RIs amounted to nearly €10 billion just from DG Regional and Urban Policy funding, the SF budgets for RIs were larger than the dedicated FP7 resources. We must note that the RI definition used in the Structural Funds is much wider than in FP7 and includes Centres of Competence in a Specific Technology (often new facilities in tertiary education establishments). Moreover, the ERDF is unlike FP7 not limited to feasibility studies and equipment, but includes buildings, planning, infrastructure connections, etc. The relevant issue is whether Managing Authorities are planning to use Operational Programmes for RIs in a manner that underpins their priorities as defined in their RIS3.

In the domain of RIs a basis for synergy is already present. A key question is in how far these funded RIs also underpin the socio-economic development and in particular the smart specialisation strategies of the regions in question, or whether the SFs were mostly an available funding source for national science policy goals. While the objectives of funding (new) RIs might clearly underpin a strategy to provide local researchers access to excellence in science, this might not be linked to the thematic areas defined in the regional smart specialisation strategy. This mismatch would make the RI investment ineligible for ERDF co-financing, as exclusively RIS3 related RIs may receive ERDF support.

There are high hopes that the next generation of funding from both Horizon 2020 and ESIF will reinforce each other. In the current documentation provided by DG Regional and Urban Policy, R&I infrastructures are positioned in the 'upstream' ESIF activities in the capacity building area, where ESIF could fund for instance the actual construction of RIs.

The Horizon 2020 Research Infrastructures Work Programme 2014-2015 states:

> *Applicants are [...] invited to identify the smart specialisation fields of their EU Member State or region and explore potential for synergies with the relevant Managing Authorities in charge of the ESI funds in their territory (page 53).*

So the link with S3 is explicitly made by inviting applicants to develop synergies in line with the S3 strategy.

The main objective behind the ESFRI approach is providing the scientific community access to excellent RIs. Nevertheless the ESFRI working paper states that to be able to adequately respond to the call for the ESFRI roadmap update, Member States and Associated Countries should link their national RI roadmaps to the ESFRI roadmap and to Smart Specialisation Strategies in Structural funds co-financed R&I

programmes, thus reinforcing the capacity of less favoured regions to host and participate in RIs of pan-European and international interest.

According to the regional Working Group report,

> *the construction of new regional RIs (either as new facilities or as upgrades of existing ones), self-standing and/or in partnership to pan-EU RIs, should offer a huge potential to respond to the need of speeding-up the development of the science and innovation sectors of the low RD&I intensity MS and thus, by acting as the catalyser for the regional competitiveness (page 13).*

A simple assumption is made that RI investments will increase the RD&I intensity and thus regional competitiveness. Nevertheless, the working group paper also says that the proposed regional RIs should be of national or regional importance in terms of socio-economic returns, training of young scientists and attracting researchers and technicians from outside the country. And they can be at the core of knowledge clusters developing the smart specialisation approach.

The tension between selecting RIs on the basis of science excellence on the one hand and regional importance in terms of socio-economic returns on the other is thus a key issue for the synergy debate. This tension seems to manifest itself on the strategic level more so than on the operational level as the previous OP and FP period have already demonstrated that joint funding of RIs is possible. Also the use of the cost-benefit analysis methodology developed for major RI projects under ERDF is recommended for the ESFRI context.

At the operational level the Guidance on Synergy spells out the regulatory aspects of what can and cannot be funded from combined ESIF and Horizon 2020 instruments.

Thus RIS3 roadmaps and Operational Programmes should envisage investments in capacity building and infrastructure targeted at their specialisation fields, while actively improving the international contacts of the R+I actors to facilitate subsequent Horizon 2020 participation.

From the Regional Policy point of view a key criterion for supporting RIs with ESIF would be its contribution and linkage to the S3 of the region/Member State in question. The link between the contribution to science excellence and the economic growth strategy of the hosting region is not always obvious. In addition what needs to be explored is the degree to which the results of the RI are sufficiently used to develop business intelligence for the industry in the region. Few RIs have dedicated technology transfer and business outreach activities. In addition the provision of Open Access to the business sector needs in line with State Aid regulations.

The current policy documents pay little attention to territorial cooperation in the field of RIs apart from the concept of setting up regional nodes to link with existing RIs. There could be a stronger focus on collaboration between the countries with low intensity of R&D&I to avoid the duplication of expensive RI investments to be used by relatively small science and research communities. A report for the Commission assessing the added value of macro-regions sees RIs as an important driver to improve coordination between regions to enhance critical mass and reduction of

overlap. [45] RIS3 have the opportunity to include cross border cooperation in the design, construction or operation of RIs.

The European Investment Bank (EIB) is another source for potential investment and finance to support particularly the construction of RIs. In the past Structural Funds period, many regions have used their financial mechanisms as co-funding source.

DG Regional and Urban Policy had set up and funded the JASPERS technical assistance system for 'new' EU Member States (as of 2014, accessible by all Member States) on a voluntary basis. It entrusted a consortium led by the EIB with the delivery of this type of technical assistance to major ERDF projects. The EIB's Operational Plan 2014-2016 states that:

> *"Through its advisory and technical assistance programmes, the Bank contributes to a more efficient and quicker utilisation of the EU Funds. JASPERS (Joint Assistance to Support projects in European Regions), in particular, will continue to support the preparation of infrastructure projects for ESIF financing and will extend the scope of its activity to the review of the quality of the projects submitted."*[46]

The EIB's Risk Sharing Finance Facility (RSFF) can be used for the financing of RIs, and particularly the dedicated ESFRI RSFF.

3.9. Societal challenges as a motor for economic growth

Societal challenges as identified in Europe 2020 and Horizon 2020 trigger the need for policy makers and authorities to address them. In the context of this report we have chosen one particular societal challenge, healthy ageing as an illustration of the potential synergies between Horizon 2020 and RIS3.

3.9.1. The combined societal and economic impact of healthy ageing

Healthy ageing is a major societal issue in terms of the costs for society, the health challenges and the societal impacts of having a larger ageing population. Ageing populations will overwhelm national health systems in the coming years. A key challenge is to support healthy ageing throughout the lifespan, aiming to prevent health problems and disabilities from an early age, and tackling inequities in health linked to social, economic and environmental factors. Alongside innovations in the organisation of healthcare, new technologies can potentially contribute to future sustainability by improving healthcare and health systems. Healthy ageing is at the same time a potential emerging sector that can create economic growth. Key innovations stem from genetic technologies, medical technologies and information and communication technologies.

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[45] Reid, A., 2013, Assessing the added value of macro regional strategies, Do macro regional strategies boost innovation and competitiveness? Report for DG Regional and Urban Policy, Technopolis, Brussels.

[46] EIB, Operational Plan 2014-2016, Luxembourg, 2014, page 10.

3.9.2. Healthy ageing in Horizon 2020

The promotion of good health is integrated in the Europe 2020 strategy.[47] For health policies and activities, the objective of smart and inclusive growth will be leading and a strong focus will be put on innovation in the healthcare sector, productivity and competitiveness, improving skills and jobs in this sector, and sustainable, healthy ageing, and efficient and effective health systems. Innovation in health, in the broadest sense, will be of crucial importance. So the topic is high on political agendas across Europe.

Horizon 2020 has identified *Health, Demographic Change and Wellbeing* as one of its policy priorities and societal challenges that ask for a critical mass of R&I. Horizon 2020 combines the societal, the R&I and the economic growth perspectives of Healthy Ageing. It also stimulates industrial leadership particularly in enabling and industrial technologies, including those that can be applied in life sciences, medical applications and health care. Horizon 2020 acknowledges that "*the complexity of the challenge and the interdependency of its components demand a European level response"*. It is typically a topic that asks for multi-level governance solutions.

The considerable share of the Horizon 2020 support for Health is related to fundamental and clinical research concerned with personalised health, understanding diseases, development of medicines and systems biology, themes which only a limited set of European regions will be able to link to their thematic specialisation and economic growth strategies. However, there are also topics related to health promotion and prevention, the development of diagnostics tools and medical devices, citizen-centre care systems, and health information systems; themes where the barriers to entry are much smaller and SMEs have a larger role to play. Other related initiatives connected to Horizon 2020 are the EIP on Healthy Ageing, where regions play an active role and the Ambient Assisted Living initiative, which supports ICT-based innovations for Healthy Ageing. Thus there is ample opportunity to link regional initiatives in health related initiatives with Horizon 2020 funding. In addition the 2014 call for EIT-KICs on *Innovation for healthy living and active ageing* provides good opportunities to link up with regional hubs for innovation, entrepreneurship and education.

The Horizon 2020 projects could not only generate synergy effects with the ERDF investments in health related R&I and e-health solutions, but also with the investments in health and social infrastructures (hospitals, elderly care homes, mobile social service and care) that offer opportunities for procuring innovative solutions. (cf.: CIP procurement of innovation projects on innovative health solutions)

Synergies potential also exists with ESF investments in care and health services, and the up-skilling of researchers to enhance their entrepreneurship skills, EaSI projects for the roll-out of social innovations in health and elderly care and e-health related digital service platform projects under the Connecting Europe Facility.

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[47] A Budget for Europe 2020 (COM (2011) 500 Final).

3.9.3. Healthy ageing in RIS3

The assessment of submitted RIS3 shows that finding solutions to societal challenges is seen as an important driver for innovations and economic growth. Thus not surprising, many of the European regions have identified *Health* as one of their key focus areas for R&I. Their actions build on existing competences and clusters and aim at achieving societal beneficial innovations. While at this stage, a complete overview of the health related smart specialisations is not yet available, a review of Information on the RIS3 platform shows that more than 30 EU regions have chosen 'Health' as one of their priority topics. [48] Our assessments of a sample of RIS3 confirm that the 'health' topic is present in many regions, in various ways. In some of Greece's strategies, e.g. an ageing population is considered an opportunity for the tourism industry.

Typically the regional actions would be either focused on the care side of the health spectrum (with innovations in the care system such as e-Health solutions and in prevention) or on the cure side (with most innovations coming from life sciences and medical devices). Common topics within these RIS3 are supporting clusters developing medical technologies (e.g. Flanders with Nanotech-for-Health) or creating living labs and population networks (e.g. North Netherlands). It is particularly this domain that is often used as the example why Europe needs smart specialisation strategies. Health and in particular life sciences and biotechnology have been in the top three 'specialisation' domains of a majority of European regions, all with ambitions to become an international hot-spot. The huge amounts of R&D investments needed, particularly in the medicine and pharmaceutical sectors, and the lengthy and high-risk life cycles of innovations have been severely underestimated by many regional and national policy makers funding R&D programmes and dedicated science parks.

At this stage most RIS3 have identified topics at a high level of aggregation and priorities in the implementation are not yet very detailed. The specific niches, competences, programmes and actions will be defined in the OPs 2014-2020 and during their implementation. The widespread number of regional actions and strategies on healthy ageing both offer advantages (linking up these individual initiatives could bring scale, speed up the valorisation process and allow for an efficient division of labour) and disadvantages (fragmentation, duplication of efforts and lack of critical mass of individual initiatives). To reap the benefits from the advantages requires networking, partnership and coordination between regions and also between regions, national states and the European Commission. Thus while there are ample opportunities for synergy, the fragmentation of activities both across multi governance levels – and thus RIS3 and Horizon 2020 – and between regions at the strategic and operational level are a major bottleneck.

In the view of the expert group, the public investments in tackling the issue of healthy ageing by means of R&I could be leveraged much better if alignment and coordination between complementary place-based strategies, between policy domains (R&I and health) and between regional, national and European levels would be reinforced.

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[48] See the S3 platform (Eye@Ris3) which lists the thematic topics per region.

3.10. Key enabling technologies and ICT

Today, information and communication technologies are one of the key drivers of socio-economic development. Even though the ICT sector itself represents around 5% of GDP, ICT drives 20% of overall productivity growth in advanced economies, and ICT industry is responsible for 25% of the total business R&D investment in the European Union (Digital Competitiveness Report 2010).

The potential of the information and communication technologies is, by far, not exhausted yet. In fact, ICT are likely to continue to drive the rejuvenation of the economies and societies both during the current as well as in the coming decade. Then again, the productivity gains ICT allows for are not endless. On-going rapid dissemination of ICT knowledge and technology across the world, and the relocation of related economic activities to the less advanced nations will bring about fiercer competition, and, ultimately, the useful potential of the relevant technology will be increasingly exhausted.

Therefore, a renewed productivity growth in Europe has to come from new emerging technologies and their corresponding industries in the coming decades. The European Commission has identified, micro- and nanoelectronics, nanotechnology, photonics, advanced materials, industrial biotechnology and advanced manufacturing technologies as the Key Emerging Technologies (KETs) for the EU.[49]

Furthermore, it is already apparent how these new KETs are more and more vigorously infiltrating the sphere of information technology, and the other way round. The evolution of the ICTs continues to fuel the above KETs as well as advanced manufacturing systems. Eventually, the evolution of KETs is about to lead to the emergence of radically new industries that drive the socio-economic development of Europe beyond 2020. This is why public R&D investment into ICTs and KETs is absolutely crucial for the European economy that continues to suffer from slow growth and insufficient short-term investment opportunities.

3.10.1. ICT in Horizon 2020

Horizon 2020 has a dedicated part of the programme, which deals with industrial leadership in enabling and industrial technologies (LEIT), and in the information and communication technologies in particular. More specifically, six main areas of R&D investment have been identified in the ICT-LEIT part of the current Work Programme in Horizon 2020:

- A new generation of components and systems
- Advanced Computing
- Future Internet
- Content technologies and information management

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[49] A European strategy for Key Enabling Technologies – A bridge to growth and jobs, COM(2012) 0341, http://ec.europa.eu/enterprise/sectors/ict/key_technologies/index_en.htm.

- Robotics
- Micro- and nano-electronic technologies, photonics.

The ICT-LEIT Work Programme features also several cross cutting topics addressing cyber-security, Internet of Things and research on a Human-centric Digital Age.[50]

Additionally, a number of other sub-programmes of Horizon 2020 utilise either explicitly or implicitly also ICT as the means for meeting the European societal challenges, e.g. development of ICT based tools for energy efficiency or innovative mobile e-government systems by SMEs.

Furthermore, ICT Labs have been established as a part of the European Institute of Innovation and Technology (EIT). Their mission is to drive European leadership in ICT innovation for economic growth and quality of life. EIT ICT Labs focus and act on societal challenges. They link education, research, and business in Europe together and enable the emergence of a Europe-wide entrepreneurial ecosystem.

3.10.2. ICTs in RIS3

There is a dual role for the KETs, incl. ICT, to play in the context of RIS3:

- KETs themselves represent a specific rapidly growing market; the overall global market volume is expected to increase from € 646 billion in 2006 to over € 1 trillion in 2015[51]

- KETs are enablers that "increase productivity, give rise to new applications and help tackle societal challenges" (RIS3 Guide, p. 86, or the MicroTEC Südwest case outlined in section 2.2).

The deployment of KETs can be an important component of an S3 because of their horizontal nature and transformative potential. Many future goods and services will be driven by KETs such as semiconductors, advanced materials, photonics, micro- and nanotechnologies. Moreover, these goods and services will be crucial in addressing the 'grand societal challenges' facing the EU, including energy supply, public health, ageing and climate change. Whilst Europe has very good research and development capacities in some KET areas, it has not been as successful in translating research results into commercialised manufactured goods and services.

The RIS3 Guide sees a comprehensive 'digital agenda' within the Smart Specialisation Strategy as a key success factor of the strategy. It is expected that digital agenda covers both the network infrastructure aspect and the role of various e-services in fostering the growth and development in region.

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[50] http://ec.europa.eu/programmes/horizon2020/en/h2020-section/information-and-communication-technologies

[51] A European strategy for Key Enabling Technologies – A bridge to growth and jobs. COM (2012) 0341, page 3.

Public policy measures to be established for the development and adoption of ICT could include:

- Fostering industrial leadership in key ICT R&D fields
- Application driven research and adoption of ICTs in all areas of the economy and society, e.g. healthcare, intelligent transport, public services, etc
- Various support measures, incl. accelerators for start-ups, international co-operation, etc.

Three conclusions can be drawn on the topic of ICT and KETs for RIS3:

- First, we agree strongly with the RIS3 guide that the key challenge for regions is to identify their respective economic niches and competitive advantages in ICT (and KETs) development and deployment activities, rather than the development of ICT and KETs in general terms.
- Second, ICT hardware and KETs based products are often very capital intensive. Access to (venture) capital is therefore essential for the respective SMEs to successfully bring new products and services to the market. This is where RIS3, national public and private funding, Horizon 2020, the various cohesion policy tools, and the European Investment Bank should act in concert.
- Finally, shortage of skilled labour and entrepreneurs is another key obstacle that does not allow Europe to take full advantage of the development and adoption of ICTs and KETs. "In the area of e-skills, for example, the level of computer science graduates is declining while up to 700 000 ICT practitioners will be needed to fill vacancies in the EU by the year 2015."[52]

One of the logical consequences of the above is that fostering synergies between Horizon 2020 and RIS3 alone would not be sufficient. Europe must seek, given the gap in the supply of qualified labour, for closer synergies between research and higher education systems, incl. co-investment into R&D and higher education infrastructure, boosting student mobility schemes, etc.

The synergies potential with ESF support for e-skills and with Erasmus+ for student mobility and Knowledge and Sector Skills Alliances could be further exploited.

The needs and public and private purchasing intentions expressed in ERDF programmes as regards IT solutions for e-government, e-learning, e-health, e-culture, e-commerce, smart grids, intelligent transport, energy and resource efficiency, could give orientations for researchers towards potential future market opportunities.

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[52] A European strategy for Key Enabling Technologies – A bridge to growth and jobs, COM(2012) 0341

4. OBSERVATIONS FROM THE REVIEW OF A SAMPLE OF RIS3 FROM THE EU-28

4.1. Key Points from this chapter

Review of RIS3

Not all countries and regions have managed to complete a full RIS3 process in the timeframe extended to end 2014, and especially most of those countries with a high dependency on ERDF funding for their R&I investments. It would be beneficial for those regions/Member States to take advantage of good practices and experiences of the regions/Member States, which have completed this cycle of RIS3 strategy building processes in an effective way.

There is often a too narrow focus on ERDF TO 1 (R&I) funding, despite the clear need for including SME, energy efficiency, renewable energy, ICT, environment, health in the RIS3 focus. Also, national and regional investments, links with ESF skills development, EAFRD innovation support in the agro-food area (one of the frequently cited RIS3 priority fields), and EMFF support for blue growth are rare.

The expert group could not assess the complete set of evidence gathering exercises and stakeholder consultation processes on the basis of the RIS3 publications alone. Including other sources, one can observe that a number of regions apply good practices described in the RIS3 guidance documents, such as SWOT analyses, the use of economic data and broad consultation events.

"Openness" to other regions, countries and globally, is in general not well developed in the strategies, thus reducing also the potential of Europe 2020 contributions. Overall, regions already internationally well connected, devote more attention to external cooperation in their RIS3 than regions with poor international linkages.

Actions to improve the participation in and synergy with Horizon 2020 remain generic, rarely attuned to the priority areas identified in the RIS3, and with few concrete concepts for synergies with COSME, Erasmus+, Creative Europe, LIFE, the Connecting Europe Facility, and other support programmes (cf. Figure 4).

The notion of using a broad innovation concept has been taken up quite well in some RIS3. However, we have also seen a set of cases where it is obvious that the research, innovation, education and entrepreneurship strategies are disconnected from each other, particularly in those countries that have used existing (national) strategy documents rather than a dedicated RIS3 strategy.

Some regions pay attention to social innovations although this is not yet common practice.

Demand led innovation approaches are very scarce.

The same is true for legislative changes and administrative reforms (e.g. university curricula, career development rules for public researchers, tax

incentives, etc.) that could unblock bottlenecks for innovation and knowledge-triangle cooperation.

There is a relatively strong focus on supporting the creation and development of new knowledge and technologies and conversely a relatively weak focus on improving the absorptive capacity and the take up of existing knowledge and technologies.

A mere reading of the RIS3 documents is not sufficient to judge whether regions have actually identified the appropriate priority areas and whether they have been sufficiently selective. Nevertheless it is evident that priorities are, more often than not, described on a very high level of aggregation (e.g. sustainable energy, bio-based economy) without an adequate analysis in which niches or positions in the value chain regional actors can be internationally competitive.

A positive sign is that many regions pay attention to the Human Capital Agenda (HCA) as an integrated element of their RIS3. However, an even stronger linkage and a broader spectrum of HCA measures would be desirable in many cases.

Overall, the implementation plans and the connection between RIS3 and the aligned policy mixes are poorly developed. Clearly, the RIS3 process doesn't stop with the publication of the strategy paper.

4.2. Material available for review

The expert group had access to all officially submitted RIS3, or other documents accepted by DG Regional and Urban Policy in the negotiation process. As mentioned in the Introduction, our mandate is to review these regional strategy documents, not with the goal to comment on individual RIS3, but to draw lessons to improve the overall potential impact for the EU, by optimally positioning vis-à-vis the Europe 2020 strategy, and by maximising synergies with other policy agendas and in particular Horizon 2020. It was expected at the beginning of our work that by the autumn of 2014 the full package of RIS3 would be available, as this was the ex-ante conditionality to receive ERDF funds. While some smaller Member States would submit one integrated national RIS3, in other countries the individual regions and counties would submit their own RIS3. From this full set of RIS3 the expert group aimed to make a selection of around 30 RIS3.

In reality, by end-2014, we had to deal with four types of situations, where countries/regions had submitted

- Dedicated RIS3 (e.g NL, ES, FR, IT, PT) some solely regional, some regional +national for the purpose of the ESIF planning
- Existing national/regional R&I strategy or group of strategy documents (AT, BE, DE, BE, DK, EE, SE and Wales) stating that this serves as the RIS3
- An existing national strategy with a separate RIS3 summary (FI, IE)
- An Action Plan informing the Commission when they would deliver their RIS3 (majority of the CEE countries).

This posed the expert group with some challenges to conduct a comparable assessment of the documents. Existing national R&I strategy papers, often some

years old, were not written with the smart specialisation philosophy in mind nor addressing the S3 requirements. Focused on the national science policy strategy, e.g., they did not cover the broader innovation agenda. Or, in the case of national R&I strategies they would not address the regional and place based dimension of innovation. For those regions where there was no formal RIS3, but a draft strategy document, we analysed this. Otherwise, we filtered out from the submitted OPs, to the extent possible, the research, technology and innovation parts as our background material. It became obvious from the OPs we studied that they detailed planned R, T & I policy measures, but did not link those with the RIS3, nor describe comprehensively the key elements of a RIS3. In these cases, we had only a limited base for a truly comparative analysis of RIS3. Unfortunately, as mentioned above, those not submitting a RIS3 to the Commission yet were mainly regions that have a large dependency on ESIF for their R&I investments. This has as a consequence that our sample of regions was skewed due to missing RIS3 documents mostly of less developed regions or countries at the time of completing this report (early 2015).

The following Figure 9 gives an overview of the sample RIS3 or similar documents that we have used for this assignment.

Figure 9 The sample of EU28 RIS3 or similar documents assessed

Country	Type of document used
Austria	"Strategy for RT&I of the Austrian Federal Government" (developed in 2010)
Belgium	RIS3 note Flanders, and New Industrial Policy
Bulgaria	Draft national RIS3 document
Croatia	An Action Plan is submitted Assessment based on informal RIS3 documents and OP
Cyprus	"Executive Summary of the S3 for Cyprus – S3Cy"
Czech Republic	An Action Plan is submitted. Informal information on RIS3 used for assessment
Denmark	National RIS3 document
Estonia	National RIS3 document
Finland	National R&D and innovation strategy, national entrepreneurship growth strategy and separate analytical RIS3 papers that inform the above.
France	RIS3 Provences- Alpes-Côte D'Azur RIS3 Limousin
Germany	"Innovation Strategy of Nordrhein-Westfalen in the ESIF framework 2014-2020" "Regional Innovation Strategy 2020 for Mecklenburg-Vorpommern"
Greece	RIS3 Central Macedonia RIS3 Central Greece
Hungary	National RIS3 document
Ireland	National RIS3 document
Italy	RIS3 Piedmonte RIS3 Molise
Latvia	Latvia submitted an Action Plan No RIS3 available for assessment

Lithuania	National RIS3 documents
Luxembourg	National RIS3 document
Malta	National RIS3 document
Netherlands	RIS3 North Netherlands RIS3 South Netherlands
Poland	An Action Plan was submitted Drafts OPs from Mazovia and Wielskopolski used as reference
Portugal	"Norte 2020 - Regional Smart Specialisation Stategy"
Romania	Draft national RIS3 document
Slovakia	Draft national RIS3 document
Slovenia	Draft national RIS3 document
Spain	RIS3 Catalonia RIS3 Extramadura
Sweden	National innovation strategy RIS3 for Stockholm
United Kingdom	"Smart Specialisation in England"

It was outside the scope of this expert group to use other data gathering methods such as interviews with stakeholders involved in the RIS3. As we wanted to have a broad representation of regions in terms of their R&I capacities and geographical locations the assessments focused on the documents submitted to the Commission.

As already mentioned, we set out to avoid duplication of the work done by Commission staff and external experts to assess and comment on individual RIS3 documents. It was not our task to assess whether the RIS3 comply formally with the RIS3 guidelines. We looked at how the RIS3 fit into the broader context of R&I strategies and policies from a multi-level governance perspective, from a good governance perspective and with a broad innovation concept in mind. We therefore approached the RIS3 analysis from a series of assumptions of what can be expected from a 'good' RIS3, and in particular with respect to the synergies with other EU policies. These assumptions derive from the analyses done in the previous chapters, and are detailed below. They refer to: alignment with existing strengths and growth strategies (section 4.3), societal challenges as part of the economic growth strategy (4.4), internalising the RIS3 guidelines (4.5), "Openness" (4.6), implementation and the policy mixes (4.6), and detailing the RIS3 budget (4.8).

4.3. Alignment with existing strengths and economic growth strategies

The RIS3 guide eloquently sums up some crucial elements of the S3 philosophy:

"The underlying rationale behind the Smart Specialisation concept is that by concentrating knowledge resources and linking them to a limited number of priority economic activities, countries and regions can become and remain competitive in the global economy. This type of specialisation allows regions to take advantage of scale, scope and spill-overs in knowledge production and use, which are important drivers of productivity. Furthermore, strategies that combine innovation with specific strengths of the national/regional economy offer a much greater chance of success. Imitating other regions by trying to create 'miracle growth' in headline industries

such as semiconductor or biotechnology not only lessens the chances for the imitating region to succeed, but also perpetuates patterns of market dominance with leaders and followers. This is why overly broad priorities that are not context specific are likely to pave a road to failure. In short, Smart Specialisation is about generating unique assets and capabilities based on the region's distinctive industry structures and knowledge bases."[53] We also expect that priority areas are defined at an appropriate level of aggregation, i.e. have the right degree of granularity.[54]

This means that RIS3 should demonstrate that they have used diagnostic tools and stakeholder processes to define these limited set of economic activities and identified the region's distinctive opportunities for diversification and knowledge bases. The evidence base used to identify the limited number of economic activities and knowledge basis is not necessarily obvious from a RIS3 document. It is, however, beyond the scope of this expert group to assess whether the choices made are sound and in line with the actual strengths of the regions. This has been the mandate of the individual assessment done by EC staff and external experts. We can however make a number of observations from our horizontal reading of a sample of RIS3 documents.

Again we have structured our assessments along a number of assumptions of what is a good RIS3 and derived some questions from these assumptions.

4.3.1. Using a wide concept of innovation

Acquisition and adoption of foreign made machinery is perhaps still the single most important form of innovation in the modern globalised economy.[55] However, we assume that a good RIS3 will apply **broad elements of innovation** and not rely on R&D and commercialisation of research results only. So we have looked at the RIS3 with the following questions in mind:

- Does the strategy focus only on research and development or also include other forms of innovation such as managerial innovation, social innovation, service innovation and technology transfer?
- Does the strategy include essential components of the value chain approach including external partners/suppliers/clients?
- Is this reflected in the overall strategy for RTDI?
- Does the region take the human capital agenda as a mechanism to develop capacities?

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[53] European Commission, Guide to Research and Innovation Strategies for Smart Specialisation (RIS3), May 2012.

[54] See Foray, D. and X. Goenaga, The Goals of Smart Specialisation, S3 Policy Brief Series No.01/2013.

[55] Cf. Lundvall et al. [21]

The analysis on this issue shows a wide variety across our sample of documents. There are a few examples of strategies mostly focusing on research capacities in the public sector but fortunately this is a small minority. Overall one can say that the notion of broad innovation concepts have been taken up quite well in the RIS3. There is a small set of cases where it is obvious that the research, innovation and entrepreneurships strategies are disconnected from each other, particularly in those countries that have used existing (national) strategy documents rather than a dedicated RIS3 strategy. A significant number of regions pay attention to social innovations as a potential growth area or innovations that stem from societal challenges.

4.3.2. Human Capital Agenda

A positive message is that in general there is serious attention to the human capital agenda (HCA) for the regions. This is, in many cases, one of the key pillars of the strategy and the action plans presented. This goes beyond the attention for the researchers and research careers and includes a wide set of educational activities such as skills for innovation, entrepreneurship, design, language and in some cases managerial skills. From reading the documentation alone it is difficult to assess whether the HCA fits with the bottlenecks and challenges of the region.

Figure 10 Good example: Talent as factor in the RIS3 of Extremadura

Talent

Responding to weaknesses in human capital faced by the region of Extremadura, one of the four areas of actions for RIS3 is "Talent". This indicates the importance paid to this development factor in the strategy. This incorporates a wide range of objectives: improvement in initial and further education; development of entrepreneurial skills; mobility; development of scientific career; development of competences in public administration; capacity of the region to attract and retain talent; language education; incorporation of human resources in R&D activities in companies. The general idea is to modernise the education systems in order to tackle the problem of high dropout rates from schools and a situation where many entrepreneurs have no education at all or only primary education. A specific orientation of education and training efforts towards the areas of specialisation is foreseen in the RIS3 action plan.

4.3.3. Building Strategic Capacities, and R&I Management Competences

We have only found limited references to building up strategic and operational capacities in the public sector for the design and management of R&I policies, and also to related competence building for the regional innovation actors. This is an especially important aspect in a policy area with relatively little tradition and experience with a subject as specific as R&I.

In the documents reviewed, there was hardly any reflection on the lessons from the implementation of previous strategies, not to speak of their systematic evaluation. This would indicate that the elements closing the policy cycle (as typified in

Figure 2) are missing, and with that opportunities to take own lessons learned on board.

In addition, and this regards the opportunities to profit from other regions' experience, policy learning features rarely on the agendas.

4.3.4. The attention to SMEs in the RIS3

It is acknowledged that the regional SME portfolio represents the bulk of the entrepreneurial activities of most EU regions. Therefore, there is a need to assess how the entire cycle from idea to market can be better supported and tailored to real needs: capacity building, coaching, access to funding mechanisms, support to finding the first clients, transfer and absorption of knowledge and technology.

The RIS3 penholders too often consider the SMEs as a homogeneous population. What is at stake is a fine segmentation of that population in several portfolios of enterprises on the basis of the type of R&I they can create, manage or absorb as well as their life cycle. A good example is the Estonian Entrepreneurship Growth Strategy, which defines three key groups of enterprises, and tailors policy actions accordingly.

A technological spin-off or start-up is looking for different support services than a social innovation one. The same is true for a biotech or an ICT enterprise. The RIS3 often tackle the commercialisation of existing knowledge and forget to support regional SMEs to acquire new knowledge.

There are also considerable shortcomings in the RIS3 regarding the role of SMEs in the innovation strategies. The following observations can be highlighted:

- No real in-depth description on how to support the non-technological forms of innovation. The issue is recognised, but there is little consideration on how to support the take up of those types of innovation

- Only a limited number of cases recognise that the absorption of knowledge by regional enterprises is the most critical issue for their SMEs as either there are no strong R&D capacities in the region or the cost of creating new knowledge is beyond the financial capabilities of regional SMEs

- The R&D ambitions of some of the less advanced regions and countries seem unrealistic. In these cases, there is a high risk that the knowledge produced will not turn into market applications because there is no strong private capacity to absorb that knowledge nor a strong track record of public and semi-public stakeholders to help the creation of spin-off and spin-out. Cases of large under-spending of ESIF funds dedicated to R&D in 2007-2013 have been reported in these countries, with little evidence that the prioritisation made through the RIS³ process will ensure a better, higher and quicker budget absorption in the period 2014-2020

- No or very little consideration (for instance in the SWOT analyses and in the argumentation of the priority choices) of the globalisation of the economy, the participation in international R&D programmes and the position of key strategic actors in the global value chain. Most RIS3 are limiting SME internationalisation to export activities

- In many cases there is no assessment of the uptake of new knowledge or technology by SMEs in the SWOT analyses. One of the future challenges of mid-size enterprises is their capacity to shift to the digitalisation, automation and robotisation of their business model. Only ICT is considered as a means to increase the competitiveness of SMEs. References to the need of investing in demo centres, fab labs and other schemes fostering the uptake of newly created knowledge are rare

- There is often an asymmetry between the perceived competitive advantage of R&D stakeholders for each priority and the track records of enterprises for those priorities in terms of knowledge absorption, niche leaders or start-up creation based on academic knowledge creation

- There is little consideration regarding better use by SMEs of research facilities as well as support to the demonstration that innovative products/services/ solutions can work in a real environment. Very little consideration is given to proof of concept (technology and commercial) of new knowledge, nor to support the finding of first clients. Only exceptionally do the RIS3 recognise the power of public procurement to help innovative enterprises access new markets.

4.4. Societal challenges as part of the economic growth strategy

The attention for societal challenges in the RIS3 is very strong. Particularly attention for the environment, sustainable energy and climate change is present in almost all documents that we have assessed. This is as such not surprising as this is a prerequisite for the Partnership Agreements. Health and healthy ageing also feature in many RIS3. What the expert group has tried to analyse is whether societal challenges have been explicitly linked to opportunities for innovation and growth:

- Do the RIS3 link societal challenges with their local economic growth opportunities (e.g. mention concrete applications, niches, markets)?
- Do these activities involve the private sector and market driven opportunities?

Again, we have found a wide variety of referrals to societal challenges. Typically, many RIS3 seem to be paying lip service to these topics from a societal perspective, but are not translating these into the priorities for economic activities. The discussions on the topics are mostly general and not regional specific. In most cases it is difficult to assess from the papers whether there will be an involvement of private sector actors or an explicit niche strategy. In a few cases the matching between societal challenges and the RIS3 strategy is very explicit. In Flanders for instance, the "targeted innovation policy" has identified strong links between Flanders' scientific and technological strengths and the major social and economic challenges. The region of Extremadura aims at turning some environmental disadvantages of the region (climate change, water shortages, desertification, loss of biodiversity, need for alternative energies) into assets, such as the development of new energy sources based on solar energy, and the exploitation of some of its assets into opportunities. We have found a minority of RIS3 where societal challenges are not mentioned at all.

Figure 11 Good example: Criteria for the identification of priorities

S3 Identification Criteria

The identification of the Strategic Activity Domains (DAS) in the French region Provence-Alpes-Côte d'Azur (PACA) has been based on an analysis of the region's competitive advantages linked to:
The presence of a critical mass of innovating actors.

The availability of other resources (training, human science…).

The European and Mediterranean position of the region.

The match with societal and environmental challenges which are especially acute in the region.

Through this latter element, societal challenges are at the heart of the DAS definition. The detailed description of the method followed for the DAS identification starts with the "identification of a strong and growing market demand at national Europe and world levels".

The DAS have been elaborated by screening large projects flowing in particular from competitiveness poles, with a priority to those with clear market potential and large private sector involvement.

4.5. Internalising the RIS3 guidelines

A good RIS3 is designed in a process following the lines in the RIS3 guide. This process is similar to the policy cycles used for the design of other, national or EU strategy documents (Strategic Implementation Plans, Strategic Research Agendas, Strategic Innovation Agendas, etc.), and thus facilitates the alignment of strategy development in the ERA and the identification of actors involved in European networks focusing on related activity fields. Not many RIS3 documents have described the process of priority setting used. From the documents alone we can mostly derive the outcome of whatever process has taken place. This lack of a description of the underlying processes can have various reasons:

- A deliberate choice has been made to focus on presenting the outcome of the RIS3 process also to a wider public. A long description of processes and tools does not fit in such a format. Malta for instance has presented its RIS3 in a communication friendly format highlighting the key elements

- When the RIS3 is based on previous (national) strategy exercises, there has not been much of a RIS3 prioritisation process to describe

- Few formal processes involving stakeholders have been used to develop the RIS3. Consequently, they are absent in the documentation.

Few RIS3 include an assessment of the regional past experience with previous EU programming period (OP, FP7...) and from regional/national policies at play. Very

few RIS3 provide detailed evidence of the past contributions of the triple helix stakeholders to upgrade the R&I eco-system. Considerably enhanced SWOT analyses, or full-fledged regional or S&T foresights, would help with this policy assessment if they discuss, for each of the chosen priorities, a matrix on achievements based on the following parameters:

- Research centres and HEI: number of licenses awarded, number of spin-offs/spin-outs created, number of spin-outs having been backed by BAs and VCs, number of spin-outs having been recognised as gazelles
- Private sector: number of start-ups created, names of niche champions, number of enterprises involved in merger and acquisition, number of active business angels, volume of VC investments
- Public sector: budget appropriation by priority, number of enterprises having been supported by national and EU funding, use of previous SF to build stairways to excellence.

There seems to be an asymmetry between the RIS3 and the OPs (for instance, in some cases there is little consideration in the RIS3 about the infrastructure stock or need, but in the OP there is budget allocated to build or equip research centres).

Nevertheless, we also found examples of elaborate strategy processes that have been described in our sample of countries/regions.

Figure 12 Good example: Region of Limousin

Good example of using a value chain approach in presenting sectorial priorities

Each of the sectorial priorities are presented in the following structured way:

- Enterprise
  - Sub-sectors of the priorities
  - Number of enterprises per subsector
  - Turnover
  - Number of innovative enterprises
  - Percentage of total projects funded by national schemes
- Research
  - Names of the public and private key research organisations/facilities
- Training / Skills
- Names of key universities and other education institutions
- Names of clusters, technical and technological centres, technology transfer organisations
- Unique selling points

Data is also provided regarding the place of the region in value chains and the

regional strengths and challenges for each of the components. Schematically, a value chain was presented as follows:

- Raw materials
- Engineering process
- Equipment / Machinery
- Production / Manufacturing
- Commercialisation / Distribution
- Applied markets
- Recycling – Maintenance – Repair

Some RIS3 documents give the impression that the RIS3 guidelines on strategy processes and stakeholder involvement were treated as a 'checklist exercise' rather than genuinely embedded in the policy formulation and design culture. It seems there is still a need for capacity building and policy learning with the public authorities in charge of R&I policies.

4.6. "Openness"

Even though RIS3 are place based strategies, a good RIS3 has a strong recognition of the region's international positioning in terms of competitiveness. We would expect that as part of the analysis of the region's strengths and opportunities, the potential of firms, niches, sectors, research organisations individuals to interact with supra-regional value chains and research competences is considered. A RIS3 of a region should not be an isolated strategy. Ideally it is connected with strategies of other (neighbouring) regions, with national and international strategies for R&I. A good RIS3 engages into inter-regional/international cooperation and stimulates opportunities for external cooperation for their key actors.

Thus, while reviewing the RIS3, the expert group examined some key questions:

- Are thematic niche strategies developed with a global competitiveness position in mind or rather a local/regional competitiveness position? Are the strategies linking to international value chains?

- Does the RIS3 outline the opportunities to link key regional actors to existing national or European P2P or P2B networks such as ETPs, JTIs, JPIs, EIPs, and mention/use existing strategy papers as guidance for the regional strategies?

- Is the inter-regional cooperation foreseen in line with their priorities (e.g. do they miss obvious partner regions?)

It was difficult to decide solely on the basis of the RIS3 documents, whether the evidence used for the prioritisation of domains, niches or topics was done on the basis of sound evidence regarding current positions or future options in global value chains. In addition whether the regions actually made choices or whether the

priority topics of the previous periods had simply been continued. We have seen a number of examples of RIS3 that have very broad lists of priority areas, which appeared to be the usual internationally acclaimed high-tech domains. There are some RIS3 that merely select science domains, with no reflection on potential innovation areas or business networks that merit public support. But we have also seen some very good examples where there appears to have been a solid evidence base and an elaborate process involving stakeholders to select priority areas that really reflect the strengths of the region.

Some regions have included cross-border cooperation as an element of their strategy stating, e.g., that their domain of specialisation extends beyond their borders.

Figure 13 Good examples of cross-border connectivity: Catalonia and Slovakia

Catalonia and Slovakia

In Catalonia the RIS3 indicates that international positioning is an important consideration since the overall objective of the strategy is to "consolidate Catalonia as a European knowledge hub". The identification of "leading sectors" in Pillar 1 of RIS3CAT results from the application of 6 criteria, amongst which internationalisation is well present. Finally, the international dimension is also visible within the output indicators listed for the strategy. RIS3CAT also supports the participation of Catalonia in interregional networks such as the Four Motors for Europe (with Baden-Württemberg, Germany Lombardy, Italy and Rhône-Alpes, France), the Pyrenees Mediterranean Euroregion, which includes the Balearic Islands, Languedoc-Roussillon and Midi-Pyrénées, and the Working Community of the Pyrenees.

The RIS3 of Slovakia has a clear idea of the specialisation of the country in EU and global economy. Linking MNCs with domestic (sub)-suppliers and upgrading the competitive advantages of the latter, planned in RIS3, fits with its economic development strategy.

With some exceptions, in the majority of the RIS3 assessed, a reflection on how the regional activities and programmes could be linked to international networks and policies or benefit from cooperation with other regions is weak or even missing.

Overall we can observe that regions that are already internationally well connected, devote more attention to this connectivity in their RIS3 than regions with poor transnational linkages.

Figure 14 Good examples of cross-border connectivity: Flanders

Flanders: International position as criterion for prioritisation

Smart specialisation policy in Flanders is closely linked to a targeted cluster policy, where the selected clusters are called "spearhead clusters". The international profiling of the "spearhead clusters" is a strong selection principle for prioritising according to competitive strengths, and this is facilitated by the use of internationalisation indicators developed by the academic research unit acting as a support point for policy in Flanders. Two of the criteria for selecting the seven strategic cluster domains pay an explicit attention to the international positioning of the domains:

- The alignment of the roadmap (and its projects) with international/European roadmaps (international positioning)
- A clear international differentiation of activities in Flanders, for achieving complementarities with international partners and competitiveness in new international markets (specialisation built on comparative advantage, critical mass, international connectivity).

As this is allowed by the regulations, there are also several "RIS3", which are in essence national strategies, with no specific references to Cohesion Policy or to regional specificities. No connectivity with the regional level could be understood for very small countries, but as a RIS3 should be essentially a regional strategy, this is a surprising situation in medium sized countries with distinct regional structures.

As mentioned, the attention to international linkages is generally poor. We have found in the analysed documents little consideration of how regional actors, niches or networks could benefit from taking part in existing networks such as European Technology Platforms, Joint Technology Initiatives and so on. A topic that does feature on quite a number of RIS3 is the question how to improve the participation of local actors in Horizon 2020. Measures are proposed to improve access and information on Horizon 2020 projects and support the actual participation. These initiatives are mostly addressed to individual academic researchers or public research centres rather than potential private sector participants.

What is often mentioned as a huge potential for synergy concerns the funding of research infrastructures (RIs) both through ESIF and Horizon 2020. We can make a few observations on this point from our sample of RIS3:

- The definition of RIs in ESIF terms is much wider than in Horizon 2020 terms. In ESIF terms basic RIs (e.g. academic laboratories, incubators) are included in the investment plans. In Horizon 2020 terms, RIs are mostly unique and expensive research equipment, data collections and facilities (in line with the ESFRI roadmap). Thus the regional investments in RIs are not necessarily potentially part of a European wide network of ESFRI type RIs.
- A number of regions with considerable ESIF funds do indeed support RIs in the Horizon 2020 sense. In quite some cases where RIs investments are scheduled in

the RIS3, references are made to national and/or European roadmaps (ESFRI) for RI investment.

- The investment in RIs is often seen as mostly an investment in local research excellence but hardly connected to the regional economic growth strategy.

4.7. Implementation and the policy mix used

The expert group's original intention was to assess whether the prioritisation and specialisation strategies developed on the basis of a place based diagnosis were translated into the actual implementation of activities presented. It should be possible to match the diagnosis and consultation components of the RIS3, with the prioritisation outcome of the strategy planning and subsequently the implementation of this prioritisation by means of a dedicated regional policy mix.

This original plan proved unfeasible for the reason that across all RIS3 the elaboration of the implementation plans was very weak:

- At best, broad headings with 4-5 pillars of the foreseen implementation plans were presented but with very little or no information on resources that would be used. In addition many measures are generic horizontal measures, not particularly targeting the identified priority areas.

- One explanation could lie in the timing of the RIS3 (in principle, this should have taken place months ahead of the detailed planning of the OP), and the unwillingness to commit to a package of instruments at an early stage.

- More problematic would be the explanation that the RIS3 strategy is disconnected from the implementation of the Operational Programmes. This could be due to functional divides (other authorities responsible for the OPs than the RIS3), inertia of existing policy programmes and measures, local lobbying for certain policies or lack of capacity with the public authorities to adapt and improve the policy mix on the basis of the RIS3 exercises.

- Nonetheless, some RIS3 list the existing set of instruments that are used currently. A positive sign is that many regions/countries seem to have a quite rich and broad policy mix which caters for most aspects of the R&I system as well as for entrepreneurship. It is beyond the scope of this expert group to comment on the effectiveness of these policies or on the question whether they match the specific challenges and opportunities of the particular region/country.

- Is the enthusiasm for the RIS3 exercise reflected in the ESIF budget allocation? Allocations in the order of 3 to 5% of the total ESIF budget give little chance that a major structural change will occur. Very often in those countries, the low level of investment in R&D is not compensated by a higher investment in SME support nor in ICT.

- We have seen only very few examples where the RIS3 process has led to the design of new and RIS3 dedicated policy programmes.

Figure 15 RIS3 as catalyst for new policy tools: Catalonia

RIS3 and influence on the policy Mix

The RIS3 in Catalonia has generated new tools closely associated to the goals of strategy, while other tools in the RIS3 policy mix cover existing policies which are being fine-tuned to respond to the RIS3 objectives.

RIS3CAT communities are voluntary associations of companies and stakeholders in the Catalan R&I system that work in coincident sectors and cooperate to incorporate R&I into production activities in the leading sectors. They play a key role in defining strategic research agendas and identifying new fields of specialisation for their domain of activity in Catalonia. An important feature of this tool is that the communities of actors across sectors are multidisciplinary and feature high private sector involvement.

PECT (territorial specialisation and competitiveness projects) also gather communities of actors, but on a territorial rather than on an "activity domain" basis.

Together, those two tools aim at gradually transforming the regional policy, from a transversal policy towards a more vertical policy, starting from 7 leading sectors, broadly defined, identifying emerging activities and building on those to define smart specialisation topics.

In line with the lack of details on the implementation of RIS3, the quality level of indicators and evaluations systems proposed – if mentioned at all – was generally poor.

- Can we conclude on the basis of this review of documents, that the engagement with the RIS3 process has made a big difference in the types of policies and activities that will be supported in the 2014-2020 programming period?

  At first sight we would have to conclude that this is not the case. However due to the lack of detailed information on the implementation plans, and the lack of an explicit link between RIS3 and OPs, it is still too early to make a final judgement. In addition, there are still quite a number of RIS3 documents missing, while these regions have already started - provisionally - to implement their OPs.

4.8. RIS3 budget

Many of the RIS3 assessed did not provide a detailed budget as requested by the ex-ante conditionality. There seem to be an assumption that the RIS3 budget will be equal to the ERDF OP earmarked budget for R&D activities. This does not guarantee, however, that enough funds will be available to implement the RIS3, e.g. if arbitration is needed between different policies (e.g., R&D vs. social agenda).

5. CONCLUSIONS AND RECOMMENDATIONS

In the previous chapters, we have summarised our analyses of relevant developments related to Cohesion Policy in the Europe 2020 context, and of a sample of the RIS3 and similar documents submitted by regions and Member States of the EU-28.

The Europe 2020 context reminds us that a mix of regional, transnational, governance, R&I, technology/industry-related, and societal-challenges-focused elements have their specific contributions to achieve the Europe 2020 objectives. In addition to the regional and national levels, different large initiatives and instruments have been established at EU level, such as the Semester processes, the Flagship Initiatives, ESIF, the new European Fund for Strategic Investments (EFSI), Horizon 2020, and other funding programmes as well as those mentioned in Figure 4. It is normal that each of them has its own way to balance the elements mentioned above, its own timeframe and implementation approach. However, a more harmonised development of timeframes and instruments, and a much more frequent exchange and mutual learning could greatly enhance the contributions of the different funding and support mechanisms to the Europe 2020 Growth Strategy. This is of course addressed to all of these large initiatives, but as RIS3 is the focus of our analysis, this chapter gathers our conclusions (section5.1), and provides recommendations (section 5.2) from an ESIF perspective.

5.1. Conclusions

At the time of writing this report, up to January 2015, the state of play was that a considerable number of regions and Member States had not yet submitted a full RIS3 as described by the regulations. RIS3 were missing particularly in regions that are very dependent on the Cohesion Funds for their R&I investments and in most need of structural change. From a logical point of view, there is a contradiction between starting the implementation of the Operational Programmes without a RIS3, which should guide and focus parts of the more detailed plans for implementing the growth strategies. From a realistic point of view, we see this now as a blessing in disguise, because the regions currently still developing their RIS3 can take up the experiences from those that have already finalised these processes. It is in the implementation of RIS3 across all regions – those with and without yet finalised RIS3 – that the proof of the pudding will be found.

5.1.1. Some general conclusions

- Progress is made, but it's still a bumpy road lying ahead: developing and implementing successful R&I policies in today's highly competitive global environment is a demanding task even for the experienced and long established R&I policy making authorities and their advisory bodies. Therefore, it comes as no surprise that we found numerous deficiencies in the analysed processes, where a multitude of actors not specialised in this field – at regional, national and EU level – had to participate in designing and deciding on the massive R&I investments through ESIF. The amounts had been decided at the highest political level by type of region without considering the specific situation of each region. Comparing the number of R&I specialists (in the Commission services, the

Member States and the regions) deciding on the allocations of Horizon 2020 funds with the R&I specialists involved for the R&I investments through ESIF, gives an idea of the challenges faced.

- Progress is made, but we also found striking discrepancies or discontinuities showing a still unstable RIS3 governance: the long and complex RIS3 development process (without even talking about its implementation) is often not yet coherently structured, prone to all kinds of breakdowns, and can still be discontinued at key junctions. We saw cases, where participative strategy processes have taken place in the regions, or productive benchmarking exercises have been implemented with the support of the S3-platform – but key results have not appeared in the formal RIS3 negotiated between the national and the EU authorities.

- The "Entrepreneurial Discovery Process" as described in the guiding documents is, conceptually and methodologically, an up-to-date approach to arrive at attractive R&I investment options, less risky for public and private actors, and thus more likely to be implemented. In many cases, we didn't see such a process, or it was not clear if there were key requirements, such as

  - a participative governance with actors willing to cooperate, and competent to balance strategic top-down framework setting and informed bottom-up elements,
  - or, if necessary, tailored content-input and methodological guidance from outside.

5.1.2. The wider innovation policy context

Regarding the wider context of smart specialisation (Chapter 2) the expert group observed:

- The Smart Specialisation Strategy (S3) approach is neither an invention of the European Commission, nor an out flux of the recent academic debate. It has proven a success in quite some regions in Europe and elsewhere. The conceptual essence of those experiences and their effective strategic planning processes can provide lessons for all types of regions.
- The persisting gap between European regions in terms of R&I performance provides a strong argument for structural change incentivised and supported by Cohesion Policies different from the past. For most regions doing more of the same is not sufficient to achieve economic and societal improvement, there is a need for differentiated, strategically re-oriented place based strategies.
- Optimally positioning local innovation eco-systems in global value chains is a success strategy for all types of regions, even if conquering world markets is not a realistic option in the near future. The thorough improvement of the local production and service fabric alone can be a solid base for sustained regional competitiveness and quality of life.
- While the focus of attention of RIS3 is on the effective use of the available public R&I investment to optimise the contribution of the ERDF to the Europe 2020 Growth Strategy, this investment is only one component of a wider set of regional, national and European policy programmes and instruments aiming at similar growth goals. Linking those policies across governance levels would optimise their impact, especially if a better harmonisation of strategic tools early in the policy formulation process could be achieved.

- One of the key aspects of the Smart Specialisation approach is a broad view of innovation. Transforming this into a successful policy strategy process reaches beyond traditional R&D policy, addressing the role of (higher) education / a broad human capital agenda, science, technology, entrepreneurship, industrial policies and FDI in fostering structural change.

5.1.3. Much room for improvement – harnessing synergies with Horizon 2020

There is more potential than ever before to exploit synergies between RIS3 and Horizon 2020 in particular, even considering the difference in policy objectives and operational rules between these two policy approaches. In Chapter 3, the expert group concluded:

- Various reports identified a set of bottlenecks (see section 3.2) explaining why in the past the synergy potential between related investments through Framework Programmes and Structural Funds has not been heavily taped. Only a part of what could have been achieved has materialised in reality in terms of aligning policy strategies and project design across governance levels and policy domains.

- There was a large group of the EU 27 countries where Structural Funds represented a significant share of their overall public R&I investments, while FP7 investments remained modest. Improvement of their policy formulation process and joint implementation, following the RIS3 guidance, has the potential to generate structural effects on their R&I systems, making them also more successful in future R&I Framework Programmes.

- Without actively seeking higher education, science and technology cooperation with actors in other regions in countries within and outside Europe, it is difficult to become excellent in some specific niches in the globalised economy. A RIS3 can identify excellent opportunities to embrace openness and build those connections, and prepare for making use of the new instruments that both ESIF and Horizon 2020 provide.

- Large public investments in Research Infrastructures still seem the preferred candidates for joint planning and funding, because aligning the scientific goals of Horizon 2020 and the ESIF socio-economic goals is not straightforward, requires deep and overarching conceptual considerations and planning competence.

- Following other parts of the world, the EU focuses stronger than before on the potential of Societal Challenges that need public sector response as a trigger for future economic growth. Given the global nature of these challenges, solutions in cooperation with other regions and countries can scale up the return on investments and the societal impacts.

- In many national and regional R&I plan, one focus is on the development of Key Enabling Technologies (KETs) and ICT as key drivers for economic development. Full success for the regional economy and society can only be expected if the absorptive capacity of the existing industrial fabric, including SMEs, is considered properly to take up those technologies and upgrade their position in a particular niche. Crucially, financial support and a full human capital agenda are important to support the technology development elements, as is the enhanced use of

novel support forms, such as pilot lines, FabLabs, LivingLabs, and other 'close to market' delivery instruments.

- A fundamental improvement regarding synergies requires structural changes concerning governance mechanisms and the use of strategic business and policy intelligence that relate / complement policy instruments across governance levels, across borders, and across policy domains and ministries.

5.1.4. Policy evidence underpinning the RIS3

A majority of the RIS3 documents display a suite of empirical evidence, although there seems to be a general lack of more advanced intelligence gathering methods and strategy processes. Traditional SWOT analyses and statistical tables dominate, and are generally more detailed than the policy (mix) and implementation parts of the strategies. From the documents available for our review, it can be concluded that most regional stakeholders are still better equipped to provide a "traditional diagnostic" than their capacity to translate the diagnosis into tailored-to-the-reality, actionable plans. Possible reasons are:

- Insufficient strategic capabilities in the region, insufficient knowledge of advanced methods and instruments, insufficient skills to produce intelligence from data
- Risk aversion to engage in new paths, partly based on the above
- No history in offsetting the "believed" competitive advantages, also partly based on the above
- Or reluctance to challenge traditional interest groups and power structures threatened by structural change.

5.1.5. Prioritisation

RIS3 priorities are defined by the Common Provisions Regulation for the ESI funds as being fit to "*build competitive advantage by developing and matching R&I own strengths to business needs in order to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts*" (cf. Article 2(3) Regulation (EU) 1303/2013).

- A majority of the RIS3 reviewed have a list of two types of priorities: economic domains and KETs. This could arise from a classical situation of fragmented policies with, on the one hand, economic ministry/agencies dealing with economic "sectors", and, on the other hand, research ministry/agencies dealing with funding of research, technology development and technology transfer activities (see e.g. the governance structures of North-Rhine-Westphalia, Estonia, Luxembourg, Croatia). The challenge of RIS3 is to jointly support RIS3 domains while covering knowledge creation, diffusion and absorption in an integrated way, thus involving synergies between various policy domains.
- Regions in centralised countries have their prioritisation exercise strongly influenced by national priorities: since much funding is coming from the national level, the room for manoeuver to choose areas that are not considered as

priorities at national level is limited (ex. North Netherlands, Provence-Alpes-Côte-d'Azur (PACA), England, Denmark).

- There are not many examples of identified societal challenges that really contribute to the differentiation sought by the RIS3 concept. Most regions/countries list the same overall challenges (health and healthy ageing, smart mobility, smart materials, secure, clean and safe energy, food safety and quality…) and include the whole range of such challenges, without a clear identification of how these apply in their specific context. Without the latter more detailed discussion, listing and describing the generic challenges do not contribute to the quality of the concrete strategy to be implemented.

- In a number of cases, the "smart specialisation areas" are rather the existing sectors of specialisation.

Linked to the topics mentioned below, priority setting, if detailed enough, is rarely considering international value chains or contributions to Europe 2020.

5.1.6. Integrated approaches

We have also seen a set of cases where the research, innovation, education and entrepreneurship strategies are disconnected from each other, particularly in those countries that have used existing strategy documents rather than developed a dedicated RIS3 strategy.

Also, inside the "ESIF family" itself, integrating instruments have not become a major force. Organising objectives and implementation structures could be stronger. Only 20 Member States in the EU-28 intend to use the Integrated Territorial Investment (ITI) option, and on average only about 2 – 5 % of the national ERDF budget is allocated for this.

Notwithstanding the above, technology-driven innovation is still the main concern of many RIS3, with a focus on increasing R&D in companies. If other forms of innovation are mentioned as opportunities, little is said on how to support them or about the competitive advantages they can create in the region.

There is also still a considerable number of RIS3 that focus primarily on the commercialisation of public R&D results and pay limited attention to other drivers of innovation, such as learning by doing, international transfer of knowledge and technology (often coupled with FDI), management and organisational change. In some regions, those could play a more important role in gearing the region's socio-economic development than pure R&D. Especially less developed regions, where non-R&D-intensive economic activities dominate the existing specialisation, tend to limit their development options by too narrow a perspective.

There is a relatively strong focus on supporting the creation and development of new knowledge and technologies and conversely a relatively weak focus on improving the absorptive capacity and take up of existing knowledge and technologies.

There has been overall not enough consideration regarding the global dimension of the economy, the complexity of value chains, and the rise of R&I capacities in emerging countries. The internationalisation potential of the regional economy is

often considered only under an export perspective. However, the exposure of the local economies to global competition has different impacts on their competitive advantages. Inside the EU, very few benchmark with other regions either to find out potential competitors, cooperation partners or trans-sectoral potential. Clusters are still considered as the sectorial panacea to support R&I while multi-sectoral platforms or networks are not yet systematically considered.

To really make a difference, a good RIS3 would analyse the existing policy mix critically, and identify the elements of it, as well as the enterprises, framework conditions and public or semi-public organisations not likely any more to create growth and jobs.

Very few RIS3 have worked out analyses at niche level, even though most regions have hidden champions, and capacities not spotted or retained as potential priorities. Moreover, many of the RIS3 do not provide evidence that they will work at cross-sectorial frontiers nor provide tools to allow the absorption of knowledge. Barriers to knowledge absorption and use in companies are given insufficient attention. Too little attention is paid to support the transformation / commercialisation of knowledge. Prototyping, demonstration, first client search, proof of concept, spin-off and seed capital are seldom mentioned in the policy mix, which can only be effectively implemented at niche level.

Some regions pay attention to social innovations although it is not yet common practice. Demand led innovation approaches are very scarce. Estonia, e.g., seeks to start using public procurement for innovation or similar measures.

All in all, when one considers the potential contribution to Europe 2020 objectives which could be derived from more integrated policy approaches to connect better regional strengths and assess across the EU, progress seems slow so far.

5.1.7. EU / international dimension

"Openness" to other regions, countries and globally, is not well developed in most of the strategies, and even the cross-border dimension (beyond Interreg) remains marginal. Overall we can observe "more of the same", i.e. regions, which are already internationally well connected, devote more attention to external connectivity than regions with currently poor international linkages.

In general, the strategies pay little attention to incentives to cooperate or join efforts with other regions, in the same country or elsewhere. A thorough analysis of the position or potential position of the regional actors in international value chains is rare, as is fund allocation outside the region. This is even true in "evident cases", where regions are actively engaged in Interreg activities, in Macro-regions programmes, or bordering "complementary" regions (e.g. urban/rural) where complementary investments could bring high additional returns in many ways. In general, the history of autarchic policy-making seems to go on.

Another way of increasing international links - actions to improve the participation in and synergy with Horizon 2020 - remain generic, rarely attuned to the priority areas identified in the RIS3, and thus not very likely to increase return on investment. This also applies to cases, where participation could be realised more easily than individual actors applying case-by-case in highly competitive calls: there are huge

untapped opportunities to link region-specific areas of smart specialisation to EU-wide P2P and P2B platforms, networks and agendas.

The high expectations, that the new outward-looking and linking possibilities in ESIF contribute specifically to Europe 2020, seem rather unrealistic from what we have seen so far.

5.1.8. Implementation

Not all countries and regions have managed to complete a full RIS3 process in the already extended timeframe, and now have to finalise their RIS3 (in theory a pre-conditionality) in parallel to implementing concrete actions in their action plan framework. Unfortunately also from a Europe 2020 point of view, or from a synergies-with-Horizon-2020 point of view, is that these are mostly cases where ERDF funding provides the lion's share of all public R&I investments.

The concept of the RIS3 is mostly one of policy strategy development, which would subsequently be implemented in the Operational Programmes. The elaboration of the implementation is therefore expected in these OPs and not necessarily in the RIS3. However the strategy development should give the direction for the implementation of measures and identify the policy mix that is needed to address the priorities defined in the RIS3. The RIS3 Guide is explicit that the definition of a coherent Policy Mix is an expected step in the process, as is a multi-annual Action Plan describing delivery mechanisms, target groups and so on.[56] This is where RIS3 and OPs should be connected.

In the strategies available for our assessment we noted:

- There is generally little attention in the RIS3 to connect the analysis to strategy development, and on this basis concretise the implementation. To really make a difference, the RIS3 should reassess the existing policy mix in order to list the elements which are (i) useful, obsolete or overused (clusters, incubators, grants, ...), (ii) most innovating and relevant and (iii) missing, and subsequently draw the appropriate consequences. The multi-annual Action Plans required by the regulations are missing in most RIS3.

- Detailed implementation plans are missing in most RIS3 although they constitute a key element according to the RIS3 Guide. This may be considered as justified on the argument that strategy is about broad directions and intervention logic, while an action plan comes next and is about the precise means to reach the broad goals. Nevertheless, there is the risk of disconnection, if a RIS3 is considered as a "paper strategy" (based on a window-dressing exercise), while the action plan represents the real policies and initiatives on the ground.

- Only in a few cases do we have examples of RIS3 implemented concretely: this takes notably the form of major (pilot) projects at the core of smart specialisation areas. This has the political benefit of making such strategies

[56] Guide on Research and Innovation Strategies for Smart Specialisation (RIS3 Guide), 2012.

visible to a wide audience, incl. companies and politicians, who often remain outside of the technocratic game of preparing paper strategies (e.g. PACA).

- Overall the implementation of indicators and evaluation systems needs considerable improvement.

5.2. Recommendations

Our recommendations – at the end all relating to the themes "governance" and "competences" permeating our report – are directed to stakeholders and particularly the public authorities at regional, Member State and European level at the following state of play: for many regions, the RIS3 or similar documents have been adopted, in about 50 % of about 200 OPs the TO1 (R&I) ex-ante-conditionality was agreed in the negotiations as fully fulfilled.[57] Also in these cases, and given the conclusions outlined above, there is the need for authorities and stakeholders to regularly assess the progress of their strategies, and reconsider approaches if the instruments and investments put in place don't have the desired effect.

We include recommendations that aim at long-term structural improvements and reach beyond the current negotiation and implementation phase.

Overarching recommendations to all involved in the different phases of the Cohesion Policy cycles

1) In the short term: harness the full potential offered by the Shared Management System, and not only at the milestones such as the final agreements on the remaining OPs, or the mid-term reviews of all OPs, to integrate the RIS3 implementation and outcomes. Improve knowledge feedback flows in general, e.g. from regional evaluations and assessments.

2) For the future: Develop - from a support- and enabling perspective - a holistic view of the "Cohesion Policy knowledge transformation process" which

   a) Starts its cycle with the 'absorption of the Regulations' at regional level, i.e. when regional actors start developing their strategies and priorities on this base.

   b) Continues with engaging the stakeholders and ensuring the necessary content and methodological input in the relevant strategy processes, in particular building on the evaluation of previous relevant policies and their impact.

   c) Develops true (cf. the definition) RIS3 and related effective implementation actions with clear roadmaps in national and regional policy tools (funding and legal/administrative) as well as in the relevant OPs (ESF, EAFRD, ERDF incl. ETC), which are then transformed in OP proposals to the Commission.

   d) Arrives at the agreed OPs in respectful, evidence-based negotiations.

   e) Follows up, in a true shared-management approach, to mid-term review and input to the Regulations' negotiations for the next phase.

[57] DG Regional and Urban Policy presentation February 2015

3) On this base,

a) Improve process design, increase stability and reliability.

b) Identify all actors involved as well as their specific needs for developing strategic, methodological and management competences, and for understanding the specifics of R&I policy design and implementation.

c) Develop targeted competency building measures – for the broad spectrum of actors in the regions, the Member States, and the EU organisations. (What the S3 Platform offers is important (see below), but covers so far only part of the necessary competence building).

Recommendations to public authorities involved in the RIS3 implementation

4) For those regions/ Member States that haven't finalised their RIS3:

a) Take appropriate advantage of the spectrum of support offered by the S3 Platform, DG Regional and Urban Policy, DG Research and Innovation and national bodies, as well as of the good practices and experiences where the RIS3 – and other EU-related strategy processes – have been completed successfully.

b) Ensure that the "Entrepreneurial Discovery Process" (EDP) doesn't become either a tick-the-box or a myopic exercise. Successful regional development in the globalized world economy requires serious and competent forward-looking and (cross-) impact assessment activities, and for that continuous methodological guidance or advanced methodological competences going beyond the "SW" in a SWOT.

5) For all regions:

a) Benefit from initiatives that take their finalised RIS3 as a base for follow-up activities: an example is the Vanguard Initiative[58] where participating regions have moved beyond strategy development and are now jointly developing cross-cutting and trans-national roadmaps and programmes for key growth areas; another is the regional-national "Horizon2020-ESIF" Synergy Platform in Germany 'institutionalising' an ongoing process.

b) Relate to the results of other EU-supported strategy processes (e.g. those of Joint Technology Initiatives or Knowledge and Innovation Communities.), such as Strategic Research Agendas (SRAs) or Strategic Innovation Plans (SIPs), as support and input for their activities.

[58] www.s3vanguardinitiative.eu

c) Establish or strengthen cooperation with communities of other policy fields, EU2020 related programmes, governance levels, etc.

d) Develop a full understanding of, and a positive approach to "Openness", invest strongly in the inter-regional/international dimension, and the opportunities from scaling-up local innovations.

6) Exploit key opportunities for developing synergies between ESIF, Horizon 2020 and other EU, national and regional policies and funding programmes for the purpose of increasing the impacts of the RIS3 based investments by:

a) Using technical assistance and other ESIF support mechanisms strategically: upgrading governance structures, improving administrative and management capacities (structures, human resources, instruments), starting with strategic capability building throughout the system.

b) Focusing synergy efforts on the priority areas in the region, not just by replicating the topics of Horizon 2020 or of national strategies.

c) Incentivising and facilitating, where appropriate, the participation of all types of regional actors (researchers, enterprises, administration and innovation enabling organisations, civil society) in Horizon 2020 also beyond the traditional R&I and SME focused projects, e.g. in Coordinating Actions, or in the large P2P and P2B networks.

d) Supporting and enabling better use of opportunities to create international/ interregional partnerships focused on S3 priority domains.

e) Lowering, in concerted efforts, barriers between policy domains, developing integrated policy approaches to key policy objectives, e.g. raising the level of R&I, or others in social, health, transport, or environmental policies, and economic policies in general.

f) Broad mobilisation for participation in focused initiatives such as the "Regional Knowledge Platform" recently agreed by DG Research and Innovation and the Committee of the Regions.

g) Adapting R&I-proven practice and project formats from Horizon 2020 in OPs (e.g. competitive calls with international peers as evaluators, 2-stage selection procedures, stage-gating of projects for SME instrument projects).

7) Integrate education, research and innovation, and broad human capital agendas more strongly in RIS3. An obvious approach is learning from successfully established Knowledge-Triangle (KT) networks, such as the Knowledge and Innovation Communities (KICs) of the European Institute of Technology (EIT), and participating in (parts of) the activities of their co-location centres could be a next step. In addition, explore the potential of new institutional developments bridging policy fields, e.g. the Committee of the Regions' SEDEC (Commission for Social Policy, Education, Employment, Research and Culture) and its envisaged cooperation with the Commission.

8) Develop advanced strategic processes for the smart specialisation areas by

a) Adapting strategy development approaches from successful RIS3 (not only those developed in the ESIF) and/or private sector management.

b) Disseminating and supporting the application of proven strategic policy and business intelligence tools.

c) Investing more effort in monitoring and evaluation, incl. developing indicators and systems geared specifically to the RIS3 process.

d) Developing, in participative processes with the stakeholders, the region-specific tools to thoroughly assess current and future competitiveness in an international context, in order to engage competently in technology foresight and innovation assessment processes, gather market intelligence, and translate these knowledge components in tailored, innovation actor group specific roadmaps.

9) Maintain the RIS3 governance principles throughout the RIS3 cycle, i.e. from strategy design and priority identification, to the shaping of the delivery tools and roadmaps, to the conception of projects and the monitoring and evaluation.

10) Support inter-regional and international collaboration of regional actors and the scaling up of local innovations in similar or complementary niches.

11) Tailor support mechanisms with a goal to improve access to Horizon 2020 or other support programmes in the priority areas that were identified in the RIS3 to increase their potential effectiveness.

Recommendations to the European Commission

12) Work with the Council, European Parliament, Committee of the Regions and others to be involved for longer-term structural changes with the aim to better harmonise ESIF monitoring and the Semester processes.

13) Integrate smart specialization as a cross-cutting paradigm of EU innovation-related policies, in particular the forth-coming revision of the Innovation Union flagship.

14) Ensure high level political and policy support for strategic, methodological, and management capability development.

15) Progress – together with the Member States – with simplifying the rules that help the simultaneous application of relevant instruments and policies across DGs.

16) Monitor the implementation of the OPs and the policy mixes with respect to the agreed RIS3 priorities, but also from a strategic Europe 2020 point of view.

17) Analyse how far the RIS3 process has influenced the actions, programmes and projects supported with ESI funds in terms of their objectives and intended target groups, and to which degree "Openness" has developed in its various dimensions.

18) Maintain the support for the peer-reviews at regional level, the dissemination of experience and good practice of RIS3 based development between regions, including the (enlarged?) activities of the S3 Platform.

19) Beyond this, incentivise or support structured mutual learning between different EU bodies, with the Managing Authorities, and between the Cohesion, the rural development and the R&I-Policy communities. Knowledge exchange platforms could explore the rich expertise across policy domains and between regions.

20) Provide transparency on the investment data from both Horizon 2020 and ESIF investment for further analysis and monitoring on progress on RIS3 and ERA.

ACRONYMS

BRIC	Brazil, Russia, India, China
BW	Baden-Württemberg
CEE	Central and Eastern Europe
CEF	Connecting Europe Facility
COSME	Competitiveness of Enterprises and Small and Medium-sized Enterprises
COST	Committee On Science and Technology
CPR	Common Provision Regulation
CSFRI	Common Strategic Framework for Research and Innovation
CSFCP	Common Strategic Framework for Cohesion Policy
CSR	Country Specific Recommendation
DAS	Strategic Activity Domains
EAFRD	European Agricultural Fund for Rural Development
EaSI	Employment and Social Innovation
EC	European Commission
EIB	European Investment Bank
EIP	European Innovation Partnerships
EIT	European Institute of Technologies
EIT-KIC	European Institute of Innovation and Technology – Knowledge and Innovation Communities
ENI	European Neighbourhood Instrument
ERA	European Research Area
ERA-NET	European Research Area Network
ERDF	European Regional Development Fund
ESF	European Social Fund
ESFRI	European Strategy Forum on Research Infrastructures
ESIF	European Structural and Investment Funds
ETC	European Territorial Cooperation
ETP	European Technology Platform
EU	European Union
EU-MS	European Union Member States
EU RTD	European Union Research and Technological Development
FDI	Foreign Direct Investment
FP	Framework Programme
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GPT	General Purpose Technology
HCA	Human Capital Agenda
HEI	Higher Education Institutions
ICT	Information and Communication Technology
ICT-LEIT	Information and Communication Technology - Leadership in Enabling & Industrial Technologies
IPTS/JRC	Institute for Prospective Technological Studies of DG Joint Research Centre
ICT	Information and Communication Technology
ITI	Integrated Territorial Investment
ITRE	Industry, Research and Energy
JP	Joint Programming
JRC	Joint Research Centre
JTI	Joint Technology Initiatives
KET	Key Enabling Technology
KIC	Knowledge and Innovation Community
KT	Knowledge Triangle
LDR	Less Developed Regions
LIFE	L'Instrument Financier pour l'Environnement

MDR	More Developed Regions
MLG	Multi-level Governance
MS	Member State
MST	Microsystems Technology
NCP	National Contact Points
NRP	National Reform Programmes
OECD	Organisation for Economic Co-operation and Development
OP	Operational Programmes
P2P	Public-Public Partnerships
PECT	territorial specialisation and competitiveness projects
PPP	Public-Private Partnerships
R&D	Research and Development
RI	Research Infrastructure
R&I	Research and Innovation
R&I&E	Research Innovation and Education
RIS3	Research & Innovation Strategy for Smart Specialisation
RIS3CAT	RIS3 for Catalonia
S3	Smart Specialisation Strategy
SEG	Synergies Expert Group
SF	Structural Funds
SIA	Strategic Innovation Agenda
SIP	Strategic Implementation Plans
SME	Small and Medium-sized Enterprise
SRA	Strategic Research Agenda
S&T	Science and Technology
TO1	Thematic Objective 1 (the R&I target)
TR	Transition Regions
VC	Venture Capital

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The existence of a national or regional Research & Innovation Strategy for Smart Specialisation (RIS3) is the 'ex-ante conditionality' for the use of European Structural and Investment Funds (ESIF) to support research & innovation for the programming period 2014-2020.

This report by a group of independent experts established by DG Research and Innovation has set out to assess the contribution of “smart specialisation strategies” to the Europe 2020 Growth Strategy in the wider context of research and innovation policies.

The report builds on the extensive support that has been made available from the Commission's services to the Member States and regions for the preparation of their smart specialisation strategies.

It includes general recommendations addressed to all participants in the process, along with specific recommendation to the public authorities involved in RIS3 implementation and to the Commission.

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