

# Strategic Alpine Space Areas for Cross-regional Cooperation

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For further information about the S3-4AlpClusters project, you will find a short description at the end of the document. To learn more and to download additional resources please refer to the project website <http://www.alpine-space.eu/projects/s3-4alpclusters/en/home>.

# Table of Contents

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<b>Key Concepts and Definitions</b> .....	<b>5</b>
<b>Summary</b> .....	<b>6</b>
<b>1. Introduction and Background</b> .....	<b>7</b>
<b>2. Findings</b> .....	<b>11</b>
2.1 Priority Areas .....	11
2.2 Specialisation Areas of S3-4AlpClusters Partners Compared to other European Regions .....	14
2.3 Specialisation Areas of S3-4AlpClusters Partners Compared to each other .....	16
2.4 Region-Specific Remarks .....	16
2.5 Policy Instruments.....	21
<b>3. Strategic Alpine Space Areas for Cross-regional Cooperation</b> .....	<b>23</b>
3.1 Strategic Alpine Space Area to Cope with Economic Globalisation .....	24
3.2 Strategic Alpine Space Area to Cope with Demographic Change.....	25
3.3 Strategic Alpine Space Area to Cope with Climate Change.....	26
3.4 Strategic Alpine Space Area to Shape the Transit Region.....	27
<b>4. The Way Ahead</b> .....	<b>28</b>
<b>Appendix: Comparative Perspectives on Cross-regional Cooperation: The Case of Massachusetts, USA</b> .....	<b>30</b>
<b>S3-4AlpClusters in a nutshell</b> .....	<b>33</b>

# List of Acronyms

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cEDW	Cross-regional Entrepreneurial Discovery Workshop
EDW	Entrepreneurial Discovery Workshop
ERDF	European Regional Development Fund
ESIF	European Structural and Investment Funds
GDP	Gross Domestic Product
KET	Key Enabling Technology
PA	Priority Area
R&D	Research and Development
RDI	Research, Development and Innovation
S3	Smart Specialisation Strategy
SME	Small and Medium-sized Enterprise
STI	Science, Technology and Innovation

# Key Concepts and Definitions

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For the purpose of this report, the key concepts and definitions are understood as follows:

- **Clusters:** Clusters are generally described as groups of companies, mainly SMEs and other actors (government, research and academic community, institutions for collaboration, financial institutions) co-locating within a geographic area, cooperating around a specialised niche, and establishing close linkages and working alliances to improve their competitiveness.
- **Cluster initiatives:** A cluster initiative is an organised effort aimed at fostering the development of the cluster either by strengthening the potential of cluster actors or shaping relationships between them. They often have a character like a regional network. Cluster initiatives may be managed by cluster organisations.
- **Cluster organisations:** Cluster organisations are entities that support the strengthening of collaboration, networking, and learning in innovation clusters and act as innovation support providers by providing or channelling specialised and customised business support services to stimulate innovation activities, especially in SMEs. They are usually the actors that facilitate strategic partnering across clusters. Cluster organisations are also called cluster managements.
- **Cluster participants:** Cluster participants are companies (users and suppliers), academia or other intermediaries, which are commonly engaged in a cluster initiative. When a cluster initiative has a certain legal form, like an association, cluster participants are often called cluster members.
- **Cluster policy:** Cluster policy is an expression of political commitment, composed of a set of specific government policy interventions that aim to strengthen existing clusters and / or facilitate the emergence of new ones. A cluster policy is seen as a framework policy that opens the way for the bottom-up dynamics seen in clusters and cluster initiatives. This differs from the approach taken by traditional industrial policies which try (and most often fail) to create or back winners.
- **Programme:** Programmes are vehicle to implement a policy, e. g. a funding programme for R&D in environmental technology. In addition to programmes, policies are also implemented through regulation (= regulatory framework, e. g. law on consumer protection).
- **Smart Specialisation Strategies (S3):** Smart Specialisation is a strategic approach to economic development through targeted support for research and innovation. It involves a process of developing a vision, identifying the place-based areas of greatest strategic potential, developing multi-stakeholder governance mechanisms, setting strategic priorities and using smart policies to maximise the knowledge-based development potential of a region, regardless of whether it is strong or weak, high-tech or low-tech<sup>1</sup>.
- **Priority Areas** are “the locus for resource concentration and prioritisation within S3”. They should include the “activities that are likely to effectively transform the existing economic structures through R&D and innovation” (*ibid*, p.3).

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<sup>1</sup> Foray, D. (2015). Smart Specialization, Opportunities and Challenges for Regional Innovation Policy, Routledge.

# Summary

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The present report identifies potential synergies among Smart Specialisation Strategies (S3) of the S3-4AlpClusters partners. It goes beyond the current state of discussion on S3 formulation and promotes a better understanding of what cross-regional collaboration and resulting synergies mean for the selected partners from the Alpine Region in the context of Smart Specialisation. The report is intended to shed light on sectors and industries which can be matched transnationally to gain critical mass for global success as well as on tools and policy instruments that can likely support such development. The report shifts away from traditional approaches to cluster matchmaking as a tool for cross-sectorial and cross-regional cooperation. It provides valuable insights into the forthcoming demands and dynamics of cross-regional cluster collaboration. It highlights the opportunities for joint innovation among regions of different population sizes as well as different investment capacities, and different areas of specialisation.

Using data collected by partners on their respective S3, a variety of indicators were analysed. The 11 S3-4AlpClusters regions are innovation front-runners which specialise in selected areas of emerging industries. The participating regions differ significantly in terms of their size, numbers, and variety of clusters in traditional and emerging industries, as well as investments and complexity of policy instruments. Individual S3 approaches of the partner regions vary greatly. Some regions use a regional innovation strategy as S3; others have one national-level S3 and another S3 at the regional level.

It is a challenge to match Priority Areas (PAs) of S3. ICT / Digitalisation, Environment / Energy, Agrofood, Life Science / Health and Manufacturing are areas most often targeted by the Priority Areas (PA) of the partners' regions. They include a variety of different sub areas which can be a source of synergies, but the partners' S3 do not define the particular areas of cross regional collaboration. There are no single policy instruments applied by S3-4AlpClusters partner regions for purposes of supporting cross-regional cooperation to create critical mass in selected priority areas in the Alpine macro-regional context. Some other studies and statistics were used in this respect. Mapping studies of the European Cluster Panorama from the European Cluster Observatory provided insights into the current strengths of the partner's regions in comparison to other EU regions. Further, S3 synergy diamonds were developed to capture the concentration of activities in the Alpine Space region in selected areas of specialisation. However, sector dynamic and flow of interactions are linked to the future development and thus cannot be accurately estimated in this phase.

The insight gained at the macro-regional level so far indicates that much more work is needed to overcome the obstacles that arise from the local context of S3. The challenge remains to understand the potential of the market and the mechanisms needed to facilitate linkages among Alpine Space actors for purposes of initiating transformative actions with actual market implications. Many more SMEs, firms, and entrepreneurs would need to be engaged in cross-regional activities in order to reach a critical mass in their respective interactions.

Cross-regional Entrepreneurial Discovery Workshops (cEDW), in this respect, can provide a forum in which such interaction might be initiated and can help to foster the creation of meaningful cross-regional linkages and synergies. In this setting, the new evidence based discussions redirect attention to the more grounded, day-to-day interactions by which real companies in real places do transactions, pursue innovations, start new businesses and create jobs. In addition, cEDW can enhance policy learning and adaptation of policy tools that can further promote the concentration of resources on those activities that transform the existing economic structures through R&D and innovation within a given region and across the S3-4AlpClusters partner regions. Ideally, a new level of interactions and activities can deliver higher returns on taxpayers' money and promote the well-being of Alpine Space community.

# 1. Introduction and Background

The ongoing globalisation of markets ties the sustainability of firms to the competitiveness of the industries in which they participate. Even in local markets, firms within industries and clusters within regions increasingly compete with firms and industries across the globe (s. Fig. 1). Success in the global market requires entire industries and corresponding value chains to deliver a product into the market faster than competitors from other countries or regions. This implies innovation and production value chains that increasingly span over countries and continents<sup>2</sup>.

**Fig. 1: Trends on globalisation**



Source: European Commission, McKinsey Global Institute, OECD

## SMART SPECIALISATION

In recent years, the Smart Specialisation concept has gained increasing importance in regions within the EU. One of the rationales for this trend is the emergence of new industries and increasing technological convergence which leads to the continuous reshaping of the business environment as well as calls for new business models, novel strategies, and creative policy approaches. On the other hand, during the current time of increasingly tight budgets, regions need to prioritise their spending on innovation efforts. The question is not whether EU regions will stop growing without innovation but rather whether the growth rate can be further enhanced by promoting more innovation in selected priority areas.

Smart Specialisations become an attractive option from the perspective of the 2014 – 2020 EC budget.

<sup>2</sup> Trend acknowledge in recent EU publication “Reflection Paper on Harnessing Globalisation”, [https://ec.europa.eu/commission/publications/reflection-paper-harnessing-globalisation\\_en](https://ec.europa.eu/commission/publications/reflection-paper-harnessing-globalisation_en).

This budget encourages more efficient use of European Structural Investment Funds (ESIF) and provides for increased synergies among different EU, national and regional policies as well as public and private investments<sup>3</sup>.

All EU member states are required to focus their innovation support policies on business areas with the largest economic and innovation potential based on strengths and comparative advantages. A set of policy principles was agreed upon in order to help foster entrepreneurship and innovation in different development contexts, and lagging regions in particular. Approved Smart Specialisation Strategies<sup>4</sup> become the ex-ante conditionality to get access to the European Structural and Investment Funds (ESIF). For many regions across the EU, ESIF becomes a key source for supporting innovation. For others, it represents only a part of their innovation budgets and has a less significant impact on the implementation of regional innovation policies.

### **S3 IN THE CONTEXT OF THE ALPINE REGION**

Structural change and the nurturing of new sectors through cluster-based approaches have been tried on many occasions<sup>5</sup>. However, the evidence from Europe is sobering. Cluster efforts have had an impact in upgrading existing clusters but have a much less impressive track-record in triggering transitions into new fields<sup>6</sup>. This observation reflects a main concern addressed by the EU regional 'smart specialisation' policy approach aimed at systematically identifying interventions that can drive transformation<sup>7</sup>.

Evidence suggests that the number of projects and studies related to S3 and clusters is extensive. However, the cross-regional and transnational component is mainly linked to collaboration within the context of Horizon 2020, ERA-NET-Scheme, EUREKA, and, among others, the European "Cluster matchmaking." The macro-regional, cross-regional, and cross-sectorial collaboration approaches focusing on gaining critical industrial mass are only now emerging.

The present report represents 11 Alpine Space regions that are gathered within the S3-4AlpClusters project. These include Baden-Württemberg (BW), Bavaria, Franche-Comté, Fribourg, Lombardy, Piedmont, Salzburg, Slovenia, Trento, Upper Austria, and Veneto. They differ in terms of their respective population sizes, clusters, areas, and numbers of specialisation. Some data displayed in Fig. 2 show a significant variety of characteristics regarding population, GDP per capita, and regional investment on research and innovation in the partnering regions. BW, Bavaria, and Lombardi accounted for almost 70 % of the population. Five of the partner regions are among the top twenty regions in Europe in terms of GDP / capita. BW and Bavaria alone accounted for 76 % of the overall investment of the partnering regions in research and innovation.

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<sup>3</sup> URL:[http://ec.europa.eu/regional\\_policy/sources/docgener/informat/2014/smart\\_specialisation\\_en.pdf](http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/smart_specialisation_en.pdf).

<sup>4</sup> Smart specialisation is not new. Rather, it is a refinement and upgrading of the existing methodology for Structural Funds programming. It is based on 15 years of experience in supporting innovation strategies in the regions, and on frontline economic thinking by major international institutions such as the World Bank, the OECD and the IMF.

<sup>5</sup> Ketels 2017, Structural Transition, A Competitiveness-Based View, Working Paper 258, African Development Bank.

<sup>6</sup> Ketels, Christian, Sergiy Protsiv (2013), *Clusters and the New Growth Path for Europe*, WWForEurope Working Paper No. 14, WIFO: Vienna.

<sup>7</sup> Foray, Dominique (2015), *Smart Specialisation: Opportunities and Challenges for Regional Innovation Policy*, Routledge Publishing: Abingdon, U.K.

**Fig. 2: Key Figures of S3-4AlpClusters partner regions**

Region	Population	GDP per capita [€]	ERDF Budget foreseen for Innovation for the period 2014 – 2020			Regional Public Funds foreseen for R&D and Innovation for the period 2016 – 2018 [€]	Total annual investment in innovation region [€]	Total annual investment in innovation region per capita [€]
			ERDF – TOTAL [€]	ERDF – NATIONAL [€]	ERDF – EU [€]			
BADEN-WÜRTTEMBERG	10,900,000	42,800	345,816,060	172,908,030.00	172,908,030	4,500,000,000	1,549,402,294	142
BAVARIA	12,440,000	43,100	265,796,000	132,898,000	132,898,000	5,100,000,000	1,737,970,857	139
FRANCHE-COMTÉ	1,200,000	25,300	45,833,300	18,333,300	27,500,000	6,000,000	8,547,614	7
FRIBOURG REGION	307,000	58,300				5,375,625	1,791,875	6
LOMBARDY	9,704,000	35,700	349,355,000	174,677,500	174,677,500	256,263,993	110,375,259	11
PIEDMONT	4,396,000	28,900	355,191,778	177,595,889	177,595,889	259,000,000	111,704,174	25
SALZBURG	540,000	46,100	10,875,000	2,175,000	8,700,000	not available	not available	not available
SLOVENIA	2,070,000	18,700	577.173.949	115,434,791	461,739,158	472,526,592	223,471,600	108
TRENTO	524,000	34,600	54.876.958	27,438,479	27,438,479	72,120,000	27,959,782	53
VENETO	4,857,000	30,800	114,000,000	57,000,000	57,000,000	not available	not available	not available
UPPER AUSTRIA	1,435,000	40,300	100,650,000	20,130,000	80,520,000	192,857,143	78,664,286	55

Source: Population and GDP per capita: EUROSTAT 2015, other data provided by project partners

## MACRO-REGIONAL SPECIALISATION PROFILE

S3 is a strategic approach to future economic development through the setting of strategic priorities. It is important to know how specialised the partners' regions already are in the sectors targeted by the Priority Areas (PAs), especially as compared to other European regions they are competing with. Cross-regional cooperation can help to bundle regional competence to further reinforce regional strengths where the regions are already highly specialised. Partners' PAs were mapped along with corresponding policy instruments. S3-4AlpClusters regions were positioned at the EU level by using cluster mapping tools and the European Cluster Panorama 2016<sup>8</sup>. Additionally, the specialisation patterns of the partner regions were compared. This process contributes to a common understanding of the PAs in the context of the EUSALP challenges. It also enables the identification of the project partner's areas to be matched transnationally in order to achieve critical mass. Such areas can be addressed by a synchronised scheme.

## S3 SYNERGY DIAMONDS

The S3 Synergy Diamond is a strategic tool to facilitate evidence-based discussions on transformative actions and areas of specialisations in the regional and cross-regional context. It is a chart created to help regions to analyse their areas of specialisations in the context of transformative actions and to better target cross-regional collaboration that can create synergies. It implies the grouping of PAs and the identification of areas of smart specialisation as a result of ongoing transformative actions between certain PAs. They capture the concentration of activities in the Alpine Space region in selected areas of specialisations. The charts are created based on the partners' S3 synergy reports. The final design of the S3 Synergy Diamonds resulted from additional consultations with S3 stakeholders that partially took part at the Entrepreneurial Discovery Workshops in Munich, Linz and Milano. The sectoral

<sup>8</sup> European Cluster Panorama, 2016, European Commission: Brussels, [https://www.clustercollaboration.eu/sites/default/files/news\\_attachment/2016-12-01-cluster-panorama-2016.pdf](https://www.clustercollaboration.eu/sites/default/files/news_attachment/2016-12-01-cluster-panorama-2016.pdf).

dynamics and the flow of interactions are linked to future development and are not presented in the diamond. Concerning this matter, the S3 Synergy Diamond provides critical inputs for cross-regional Entrepreneurial Discovery Workshops (cEDW) and, as a result, cEDW serve as a forum in which such interaction might be initiated and can help to foster the creation of meaningful cross-regional linkages and synergies. S3 Synergy diamonds provide a setting for evidence based discussions and present a tool for redirecting attention to the actions lead and motivated by entrepreneurs.

## **POLICY INSTRUMENTS MIX FOR TRANSFORMATION**

Policy instruments used by partners regions were mapped to select those that support cross regional collaboration. All regions have dedicated instruments to support R&D. However, the map indicates that the front-runners in transformation invest significantly more into innovation and use a much broader scope of policy instruments. The main difference is that workforce development and technology transfer are integral parts of the targeted policy mix as well as networking and clustering are embedded in the system. The comparison with similar efforts in Massachusetts, USA (in appendix), demonstrates that such complex schemes with strong support for workforce development, technology transfer and embedded networks is characteristic of global “hot spots” of innovation and sustainable transformation. In general, smaller regions use less complex policy instruments, and, in many cases, focus primarily on R&D. There is no one single policy instrument that is applied in S3-4AlpClusters partner regions to support cross-regional cooperation to create critical mass in selected priority areas for the Alpine macro-regional context. In this setting, cEDW can enhance policy learning and adaptation of policy tools that can further promote the concentration of resources on those activities that transform the existing economic structures through R&D and innovation within a given region and across the S3-4AlpClusters partner regions.

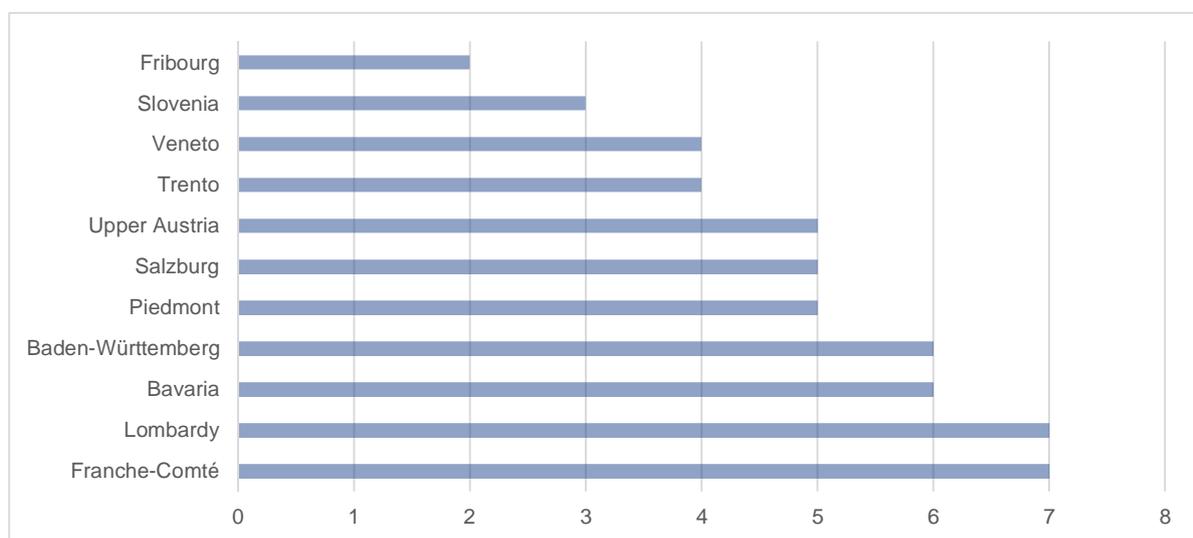
The identification of synergies this report aims for is based on the assumption that all Alpine Space regions have developed Smart Specialisation Strategies. Related Priority Areas can serve as Strategic Alpine Space Areas for cross-regional cooperation. A variety of indicators were analysed by using data collected by partners on their respective S3. In the present exercise, three basic principles were applied: collection of relevant data on S3 from partner regions, utilisation of consultation and feedback from partners and experts, and ensuring alignment between EU Strategy for the Alpine Region (EUSALP) challenges and objectives of S3-4AlpClusters partner regions.

## 2. Findings

### 2.1 Priority Areas

The analysis of the S3 of the partner regions shows that numerous priority areas (PAs) and application areas have been identified<sup>9</sup>. PAs are place-based areas of greatest strategic potential for a given region. Thus, PAs represent such areas where regions expect the emergence of new industries and opportunities for future growth. PAs also represent those areas where regions intend to invest in research and innovation. Regions have a different understanding of the meaning of PAs which lead to a broad scope of interpretations. Some PAs are quite generic (e. g. Health or Manufacturing), others are much more narrow (ICT for societal applications). Regarding the numbers of PAs defined in the regional S3 strategies, the picture is heterogeneous (Fig. 3). Franche-Comté and Lombardy both identified seven PAs whereas Fribourg identified just two.

**Fig. 3: Number of PAs per region**



Source: S3 summaries provided by project partners

The picture becomes even more diverse since some regions not only identified PAs, but also fields of specialisation or application fields. Although there is no clear definition of what can be understood by both and how they differentiate from the understanding of PA, it seems to be that fields of specialisation are often understood as a certain kind of “Sub-PA” that is more narrow than the PA (e. g. eHealth). Application fields can be understood as fields where the knowledge / new technologies / innovations created within a PA can be applied (e. g. Microsystems in Automotive). However, this is more an interpretation on the part of the authors than an evidence-based analytical finding.

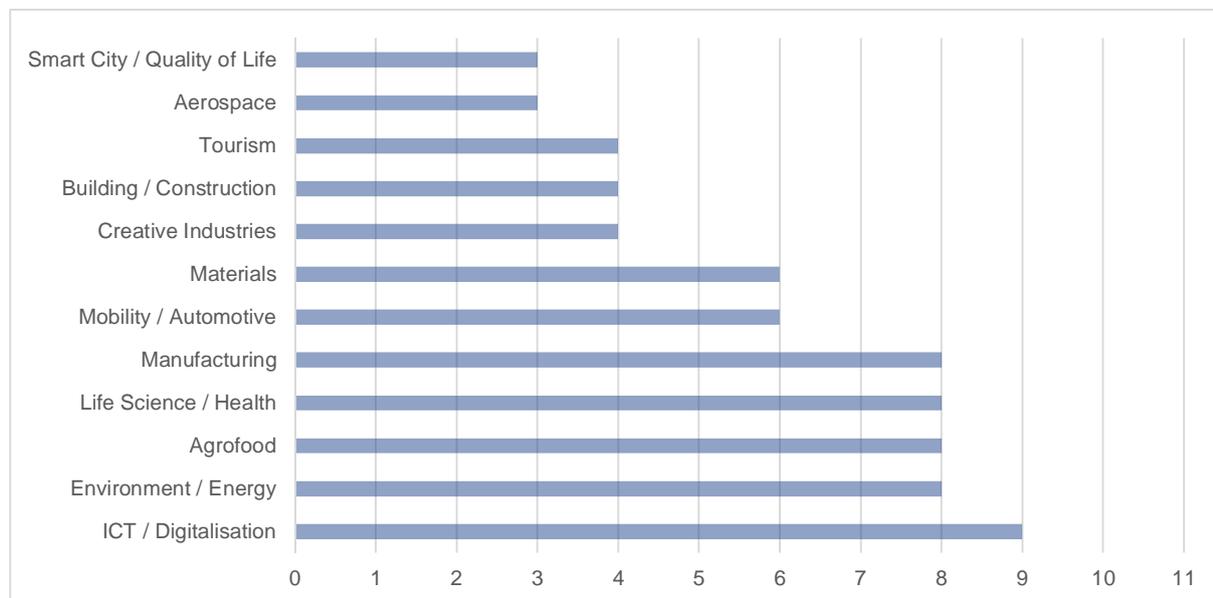
<sup>9</sup> They should include the activities that are likely to effectively transform the existing economic structures through R&D and innovation.

**Fig. 4: Sectors covered by the partners' regions PA**

	Number of PAs	Agrofood	Manufacturing	Mobility / Automotive	Creative Industries	Life Sciences / Health	Materials	ICT / Digitalisation	Environment & Energy	Tourism	Smart Cities / Quality of Life	Building / Construction Building	Aerospace
Baden-Württemberg	6		x			x	x	x	x				x
Bavaria	6		x	x	x	x		x	x				
Franche-Comté	7	x	x	x		x	x	x	x				
Fribourg	2	x					x	x	x	x		x	
Lombardy	7	x	x	x	x	x			x				x
Piedmont	5	x		x				x	x				x
Salzburg	5		x		x	x	x	x		x		x	
Slovenia	3	x	x	x		x	x	x		x	x	x	
Trento	4	x				x			x	x	x		
Upper Austria	5	x	x	x		x		x	x				
Veneto	4	x	x		x		x	x			x	x	
		8	8	6	4	8	6	9	8	4	3	4	3

Fig. 4 displays which sectors are targeted by the project partner region by PA. Sometimes the PAs defined by the regions cover more areas than one sector (e. g. Fribourg “Tourism and Food” or Baden-Württemberg “ICT and Intelligent Production”). When having a closer look at the PAs across the participating regions, it becomes clear that sectors like ICT / Digitalisation, Environment / Energy, Agrofood, Life Science / Health and Manufacturing are areas most often targeted by the partners' regions PA (Fig. 5).

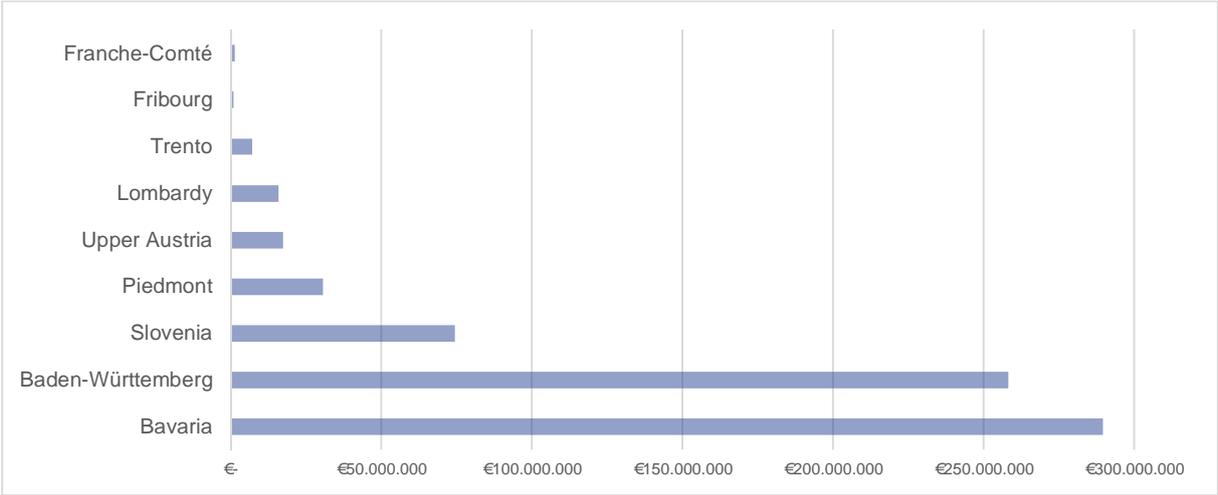
**Fig. 5: Number of regions that prioritise certain sectors based on their PA**



Source: S3 summaries provided by project partners

Fig. 6 shows how different regions, on average, intend to invest per PA. Whereas Bavaria and Baden-Württemberg invest more than 250 Mio EUR per PA on average per anno, Trento, Fribourg and Franche-Comté invest less than 10 Mio EUR. It is obvious that this can lead to **significant disparities in STI capacity and investments**. However, an educated guess would be that those regions that invest comparably low amounts of money will significantly benefit by bundling financial resources across neighbouring regions and, thus, can achieve a critical mass in terms of public (and private) investments in order to gain industrial leadership in these PAs.

**Fig. 6: Public regional investment per PA**



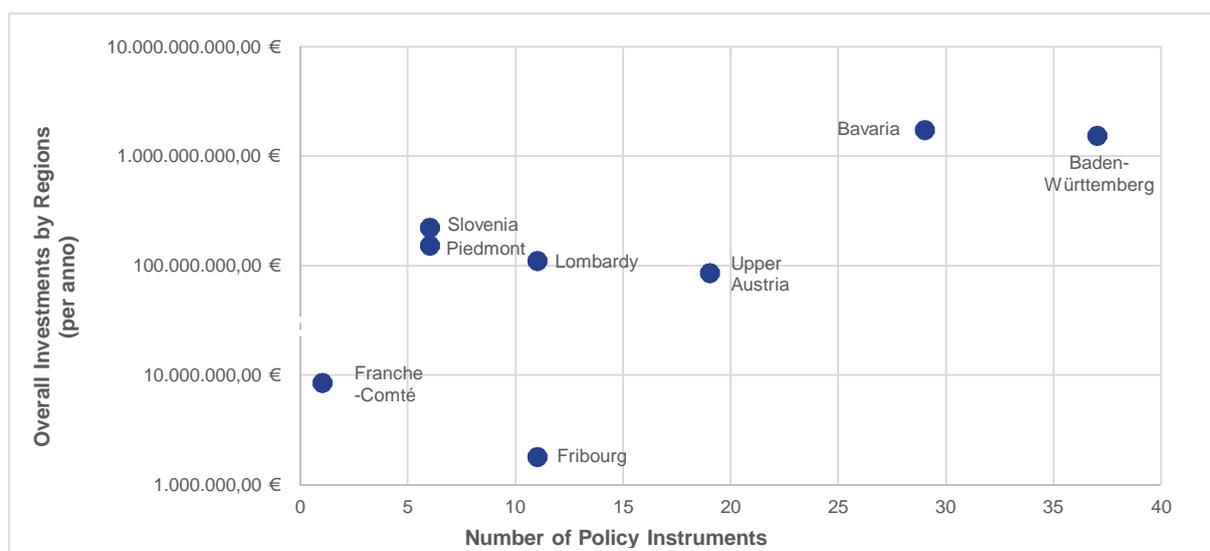
Source: S3 summaries provided by project partners, no data provided for Salzburg and Veneto

Partner regions reported about 125 policy instruments which address innovation interests linked to the 57 Priority Areas. They reflect a high degree of variability and extensive horizontal linkages. Bavaria - and to certain extent Slovenia – both have specific measures directed at their respective Priority Areas. In terms of the cross regional and cross sectorial cooperation, regions tend to display limited activities. The alignment of policy instruments among neighbouring regions is very low.<sup>10</sup> Some of regions promote export by using clusters and only Baden-Württemberg launched transregional support schemes with Sweden and other Scandinavian regions focused on innovation.

Fig. 7 compares the number of policy instruments per regions against the overall annual public investment in STI. Baden-Württemberg applies a high number of policy instruments. This allows the region to have very tailor-made and demand oriented policy instruments in place with significant budgets. The Fribourg region defined more than 10 policy instruments, but tends to have a less than critical amount of funding on average due to the low overall public investment. Franche-Comté, spending a similar amount of public funding per year, works with a lower number of more generic policy instruments that all cover the different areas defined in its PA. Also Slovenia and Lombardy have a high amount of public funding (on average) available per policy instrument.

<sup>10</sup> See StressTest results, <http://www.alpine-space.eu/projects/s3-4alpclusters/en/home>.

**Fig. 7: Annual overall investments vs. number of Policy Instruments**



Data provided by the partners, no data available for Salzburg and Trento

These first results put forward a variety of issues that need a closer look in the next phases of the project. The ongoing discussions point out that much more clarity is needed on how current PAs (and Areas of Specialisation / Application Areas) are defined and embedded in regional innovation policies and strategies and which PAs can be best matched transregionally in order to gain critical mass. Exchanges with partners confirmed that much more attention should be given to the Entrepreneurial Discovery Process as a tool to identify demand-driven opportunities for cross-sectoral cooperation. One of the core objectives might be to bundle strengths to keep or gain industrial leadership in those areas which are of interest for the Alpine Space regions.

## 2.2 Specialisation Areas of S3-4AlpClusters Partners Compared to other European Regions

The previous chapter has shown that the following PAs are of most interest to the partner regions:

- ICT / Digitalisation,
- Environment / Energy,
- Agrofood,
- Life Science / Health, and
- Manufacturing.

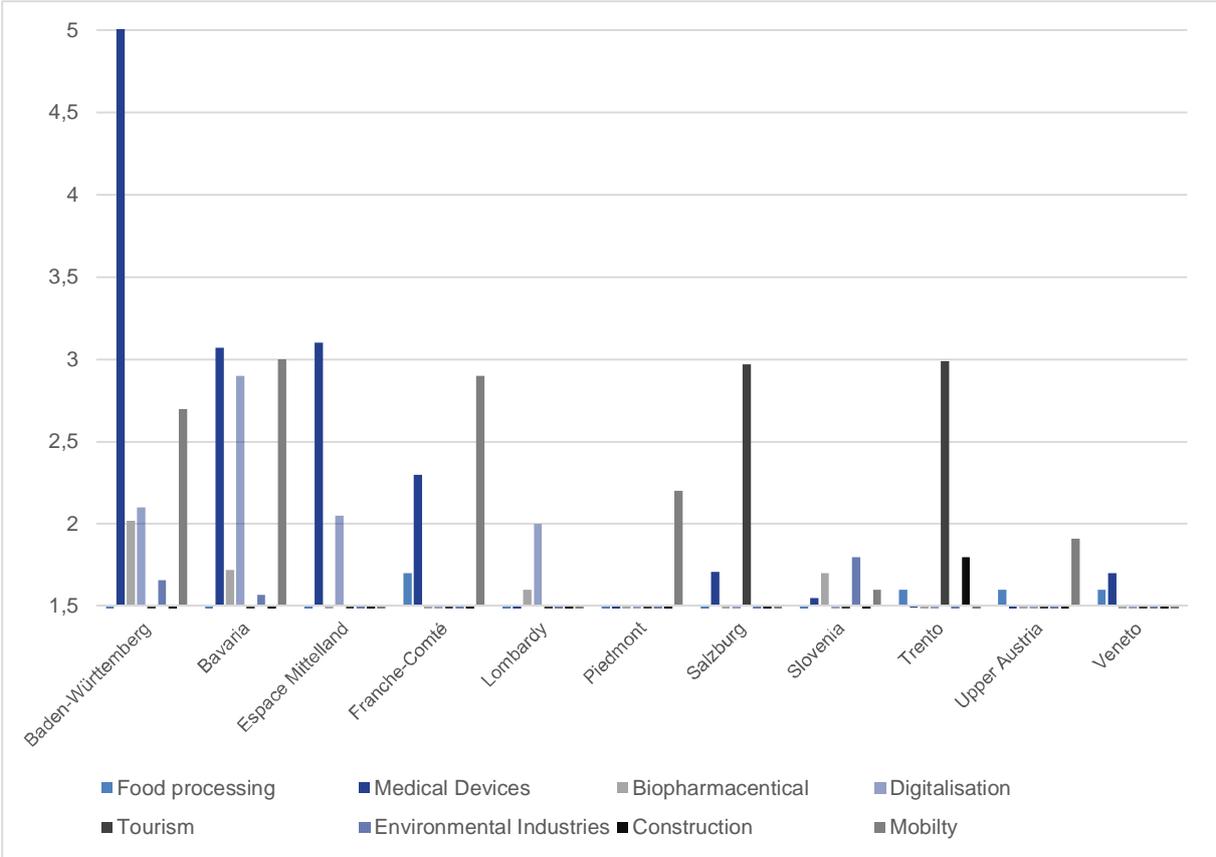
For purposes of cross-regional collaboration based on regional strengths, the position of the project partner regions within Europe needs further consideration. How much specialised are the partner regions in these PA compared to European peers? Specialisation can be measured by the relative size of regional employment in a given sector (or PA) reflected in its location quotient (LQ)<sup>11</sup>.

<sup>11</sup> An LQ is computed as an industry's share of a regional total for some economic statistics (earnings, GDP by metropolitan area, employment, etc.) divided by the industry's share of the regional total for the same statistic. For example, an LQ of 1.0 in mining means that the region equally specialises in mining; while an LQ of 1.5 means that the region has a significant higher concentration in mining than other regions. Bureau of Economic Analyses, [https://www.bea.gov/faq/index.cfm?faq\\_id=478](https://www.bea.gov/faq/index.cfm?faq_id=478).

This relative measure indicates how much stronger a region is in a specific sector (PA) than it would be expected given its overall size, compared to the average employment size in the specific sector (PA) across all European regions. The European Cluster Panorama 2016<sup>12</sup> was used for positioning the S3-4AlpClusters region in the EU regarding specialisations, but Fribourg region is not included in this analysis as the data for Switzerland were not available.

Fig. 8 displays to where S3-4AlpClusters partner regions are highly specialised compared to all EU regions, e. g. in Mobility (6 regions), Medical Devices (5 regions), Biopharmaceutical (4 regions), Digitalisation (3 regions), Environmental Industries (3 regions), and Tourism (2 regions) can be considered. Very regional specific LQ-values are given for Baden-Württemberg (6,5 for Medical Devices), Bavaria (3,1 for Medical Devices), Franche-Comté (2,7 for Mobility), Salzburg and Trento (both 3,0 for Tourism).

**Fig. 8: Specialisation areas of selected Alpine Space regions with comparison with European peers**



Source: European Cluster Panorama and location quotient of partners' regions in selected sectors compared to 251 European NUT 2 region; no data available for Fribourg region, Espace Mittelland was chosen as corresponding NUT 2 region.

The findings given in Fig. 8 show good conformity to the PA defined in the partner regions' S3. The only exception is the Agrofood area, where most of the regions scored between 0,6 (Baden-Württemberg) and 1,6 (Trento).

<sup>12</sup> European Cluster Panorama, 2016, European Commission: Brussels, [https://www.clustercollaboration.eu/sites/default/files/news\\_attachment/2016-12-01-cluster-panorama-2016.pdf](https://www.clustercollaboration.eu/sites/default/files/news_attachment/2016-12-01-cluster-panorama-2016.pdf).

## 2.3 Specialisation Areas of S3-4AlpClusters Partners Compared to each other

Similar comparisons of regional specialisation were done as described in the previous chapter, but here the specialisation pattern of partner regions were compared among themselves. Keeping in mind that the report makes an attempt to find Strategic Alpine Space Areas for cross-regional cooperation, those sectors (PAs) might be of interest, in which the partner regions are not only strong on European but also on Alpine Space level. This approach leads to 17 Alpine Space regional specialisation hotspots, where a S3-4AlpClusters partner region is significantly more specialised than others (Fig. 9). It nicely shows that some of the smaller partner regions are highly specialised in several sectors, even within the Alpine Space Region (e. g. Trento).

**Fig. 9: Partner regions specialisation hotspots**<sup>13</sup>

Region	Sector
Baden-Württemberg	Medical Devises
Bavaria	Digitalisation of Industry
Espace Mittelland	Digitalisation of Industry
Franche-Comté	Food Processing, Mobility
Lombardy	Biopharmaceuticals, Digitalisation of Industry
Piedmont	Food Processing, Mobility
Salzburg Region	Tourism
Slovenia	Biopharmaceuticals, Environmental Industries
Trento	Food Processing, Tourism, Construction
Upper Austria	Food Processing, Construction
Veneto Region	Food Processing

Source: European Cluster Panorama; location quotient of partners' regions in selected sectors compared to themselves; no data available for Fribourg region, Espace Mittelland was chosen as corresponding NUT 2 region.

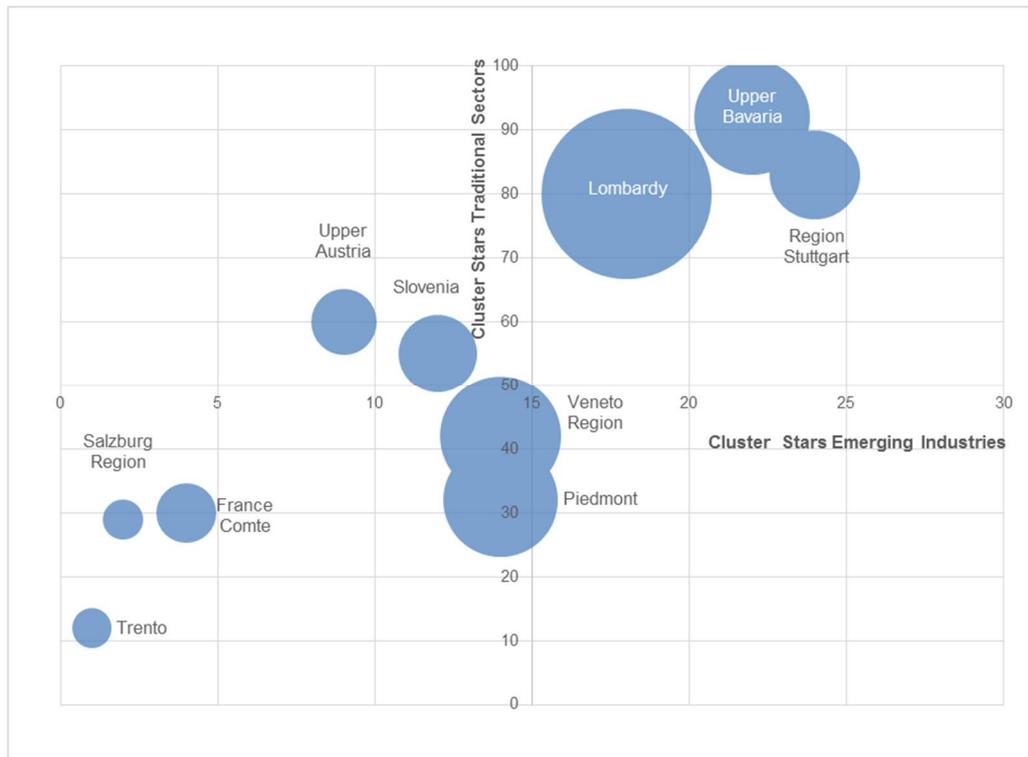
## 2.4 Region-Specific Remarks

The following figure presents region-specific information that summarises the main highlights based on the assessment of individual S3 for the respective regions. Fig. 10 introduces the starting position of the partner regions (coloured in blue) by comparing their competitiveness in the fields of traditional, sectoral industries with emerging, cross-sectoral industries. This comparison is based on the methodology of the European Cluster Observatory<sup>14</sup>.

<sup>13</sup> The specialization hotspots were identified by comparing the sector (PA) among each other within the region as well as between the regions

<sup>14</sup> According to the most recent European Cluster Observatory data.

**Fig. 10: Comparison of strengths of clusters in traditional and emerging industries**



*According to the most recent European Cluster Observatory data; Methodology based on data presented in the European Cluster Panorama 2016; no data available for Switzerland / Fribourg region*

Partner regions can be found in three of the four quadrants (Fig. 10):

1. **Upper right level:** Regions with a strong industrial base in traditional industrial sectors and strong emerging industries (Quadrant I): Bavaria, Baden-Württemberg, and Lombardy.
2. **Upper left level:** Regions with a comparable strong industrial base in traditional industrial sectors, but a few strong emerging industries (Quadrant II): Slovenia and Upper Austria.
3. **Lower left level:** Regions with limited industries in traditional and emerging sectors (Quadrant III): Franche-Comté, Trento, and Salzburg.

Piedmont and Veneto build a certain group “in the middle”, sharing some characteristics of all other groups. A closer look indicates some common patterns relevant for each of the quadrants.

**1. Upper right level: Regions with a strong industrial base in traditional industrial sectors and strong emerging industries (Quadrant I):** Bavaria, Baden-Württemberg, and Lombardy.

These regions succeeded in building strong emerging industries (and strong clusters) starting from strong traditional industrial industries (regional assets). Regardless of whether these regions already had a certain kind of smart specialisation strategy in the past, the industry base successfully incorporated new emerging industries. All three regions are among EU hotspots of emerging industries and hotspots of clusters.

While all three regions count a high number of gazelles<sup>15</sup> in emerging industries, especially Lombardy outperforms all EU regions in terms of employments' level in the gazelles (s. Fig. 10). The box below summarises some characteristics for the three regions.

Baden-Württemberg	Bavaria	Lombardy
<ul style="list-style-type: none"> <li>Public investment in RDI 1.5 BN EUR per year with a small share of ERDF</li> <li>Hot-spot region in emerging industry</li> <li>S3 is the regional innovation strategy</li> <li>Dialogue-driven policy process since decades</li> <li>Complex policy instruments allows targeted funding*</li> </ul>	<ul style="list-style-type: none"> <li>Public investment in RDI 1.7 BN EUR per year with a small share of ERDF</li> <li>Hot-spot region in emerging industry</li> <li>S3 is the regional innovation strategy</li> <li>Complex policy instruments allows targeted funding*</li> </ul>	<ul style="list-style-type: none"> <li>Small share of public investment coming from ERDF</li> <li>S3 designed in line with the EC</li> <li>Separate S3 governance is created</li> <li>Highest level of employment in gazelles in Europe</li> </ul>

\*Comparable to more than S3-4AlpClusters regions

## 2. Upper left level: Regions with a comparable strong industrial base in traditional industrial sectors, but a few strong emerging industries (Quadrant II): Slovenia and Upper Austria.

Slovenia and Upper Austria have a high number of cluster stars in traditional industries. Both result in a good basis on which to create new emerging industries but might be challenged with limited options for scaling up in their home regions. Cross-regional cooperation in selected areas has the potential of accelerating the emergence of new industries that are important for both regions. This is the case due to limited capabilities in academia and industries as well as in public investments (compared to other regions positioned in the upper right quadrant).

Slovenia developed a comprehensive S3 based on an entrepreneurial discovery process which resulted in well-selected transformative activities in which a new generation of clusters (strategic partnerships) plays a critical role. Slovenia is the only country with significant investment per priority areas comparable to Baden-Württemberg and Bavaria. Upper Austria did not develop its own S3 strategy since it is well aligned to Austrian S3. Firms and actors align their project objectives to national S3 when they apply for structural funds.

Upper Austria	Slovenia
<ul style="list-style-type: none"> <li>S3 at the level of Austria</li> <li>High attention given to clusters as tool to implement S3</li> <li>Complex policy instrument with limited programme budgets</li> </ul>	<ul style="list-style-type: none"> <li>3<sup>rd</sup> highest public investment in RDI among S3-4AlpClusters partners</li> <li>Comprehensive S3 based on facts and Entrepreneurial Discovery Processes</li> <li>Strategic partnerships as a backbone of S3 implementation*</li> <li>Small number of policy instruments, but with significant programme budgets</li> </ul>

\*Comparable to more than S3-4AlpClusters regions

<sup>15</sup> Gazelles are considered to be fast-growing new firms (less than 5 years old and grew by at least 10 % a year over 3 years). Data from the European Cluster Observatory 2016.

### 3. Lower left level: Regions with limited industries in traditional and emerging sectors (Quadrant III): Franche-Comté, Fribourg, Trento, Salzburg, Piedmont, and Veneto

Regions in this group are characterised by the size and by highest specialisations in selected fields (s. Fig. 8). Further transformative actions might be challenged by the rather low number of clusters in strong traditional industries. Thus, cross-regional collaboration among these types of highly specialised small regions is of very high importance. This is not necessarily to bundle industrial critical mass but rather to be more exposed to global demand from different areas. Cross-regional cooperation brings together areas of individual regional strengths that can, when merged, act as a starting point for new emerging industries. The respective S3 take this demand into account. However, the current S3 of all regions analysed in this report are limited in terms of initiating cross-regional cooperation<sup>16</sup>.

#### *Smaller, but highly specialised regions*

Franche-Comté	Fribourg Region	Trento	Salzburg
<ul style="list-style-type: none"> <li>Highest number of PAs among all partners</li> <li>Cross-regional cooperation with neighbouring regions encouraged</li> <li>One generic policy instrument in place</li> </ul>	<ul style="list-style-type: none"> <li>S3 run as joint public private efforts, not linked to the guidelines of the EC</li> <li>Lowest number of PAs (two) among the project partners' region</li> <li>Comparable high number of policy instruments in place compared to the limited public investments</li> </ul>	<ul style="list-style-type: none"> <li>S3 process is run according to the guidelines of the EC</li> </ul>	<ul style="list-style-type: none"> <li>S3 at the level of Austria</li> <li>Strong focus on cross-regional cooperation in Life Science and Smart Data</li> <li>High number of policy instruments in place compared to the limited number of public investments</li> </ul>

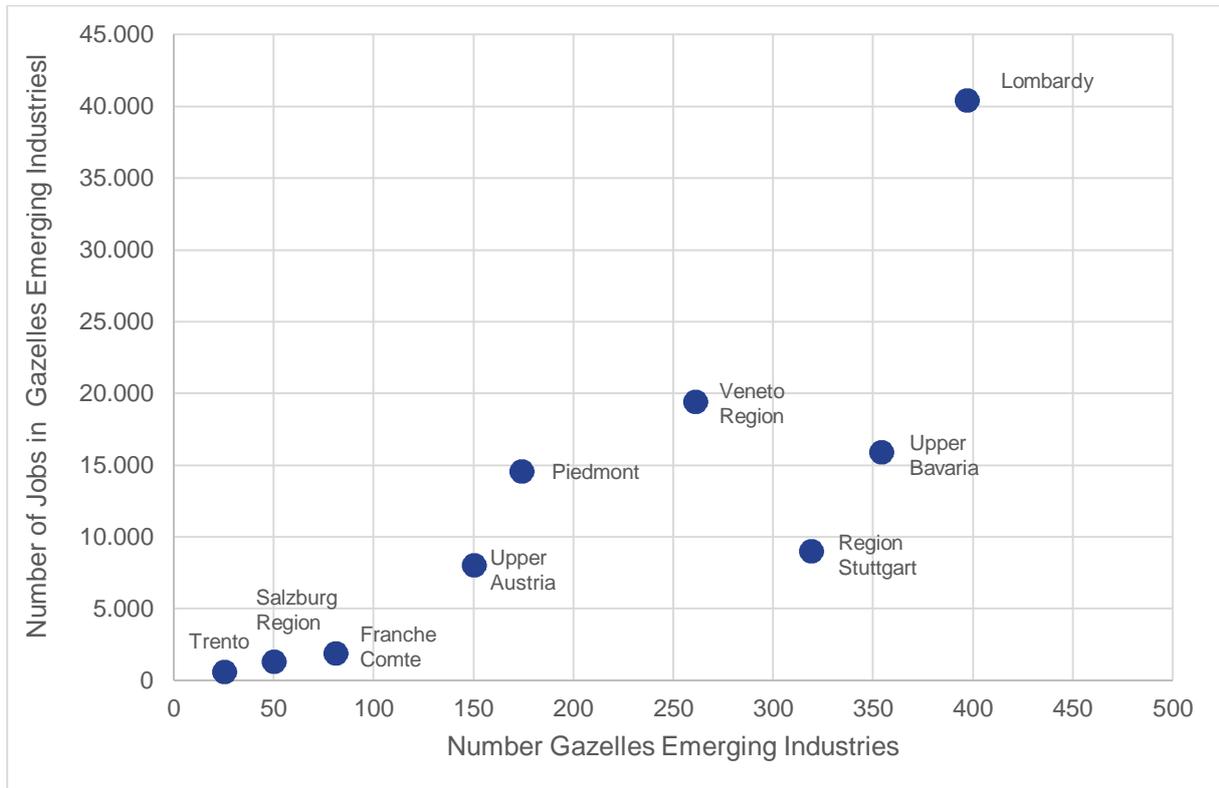
#### *Entrepreneurial driven regions*

Piedmont	Veneto
<ul style="list-style-type: none"> <li>Small number of policy instruments, but with significant programme budgets</li> <li>Very high level of employment in gazelles in Europe</li> </ul>	<ul style="list-style-type: none"> <li>S3 process is run according to the guidelines of the EC</li> <li>S3 is well aligned on national and neighbouring regional level</li> <li>Very high level of employment in gazelles in Europe</li> <li>Cluster initiatives are actively involved in the development of S3</li> <li>Missing data for regional, non-ERDF funds</li> <li>Policy instrument dedicated to R&amp;D</li> </ul>

Piedmont and Veneto region lay in the same Quadrant III than other peer regions, but are significantly different in terms of entrepreneurship (S. Fig 11). It is not only the number of gazelles in emerging industries that is comparable high; it is even more the number of employees per gazelle that outperforms all other regions (except Lombardy). While they have 75 or more employees on average, the corresponding figures for all other regions (except Lombardy) are below 40.

<sup>16</sup> See regional StressTest reports, available at: <http://www.alpine-space.eu/projects/s3-4alpclusters/en/home>.

**Fig. 11: Number of jobs in gazelles in emerging industries vs. total number of gazelles**



*According to the most recent European Cluster Observatory data; methodology based on data presented in the European Cluster Panorama 2016; no data available for Switzerland / Fribourg region*

## 2.5 Policy Instruments

The figure below depicts the current status of the policy instruments for implementation of S3 in partners' regions.

**Fig. 12: Policy instruments applied for the partner regions**

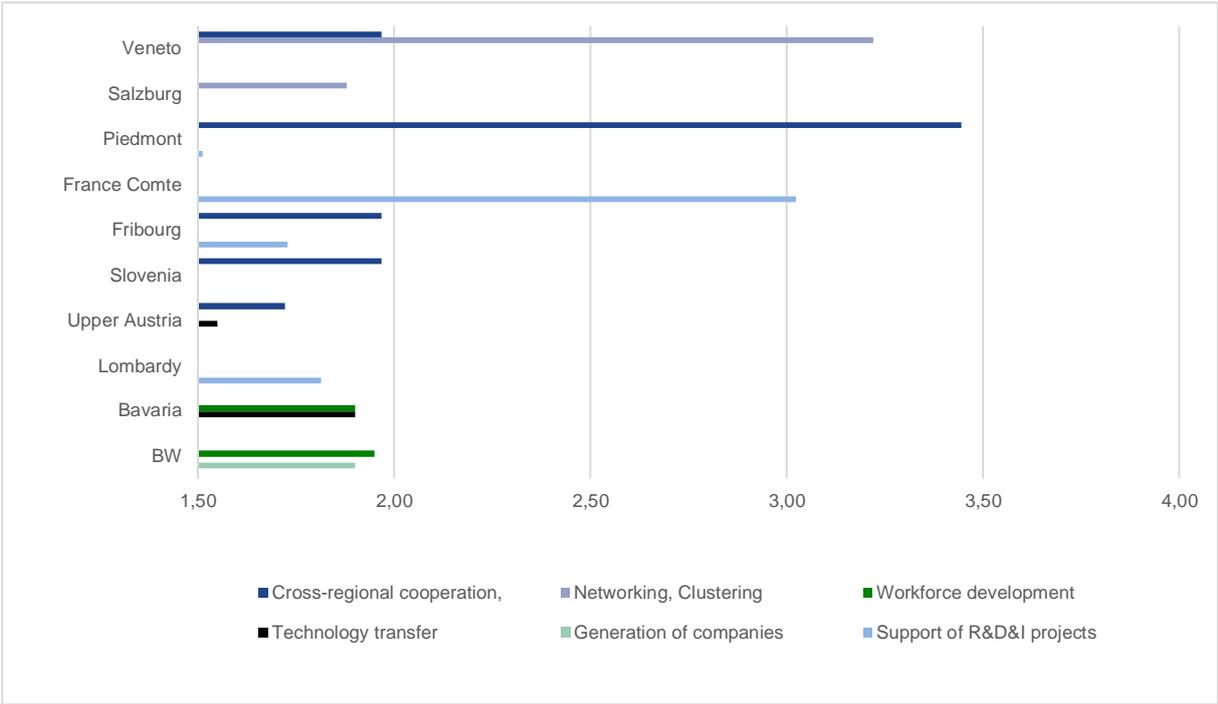
Quadrant	Support of RDI projects	Generation of companies	Technology transfer	Workforce development	Networking, Clustering	Cross-regional cooperation, Internationalisation	Total Policy Instruments
<b>I</b>	20	20	9	18	6	3	76
<b>BW</b>	8	12	3	9	3	2	37
Bavaria	6	7	6	8	2	0	29
Lombardy	6	1	0	1	1	1	10
<b>II</b>	9	3	5	2	2	3	23
Upper Austria	6	2	3	1	2	2	16
Slovenia	3	1	1	1	0	1	7
<b>III</b>	12	4	2	1	3	3	25
Fribourg	4	1	1	0	0	1	7
Franche-Comté	1	0	0	0	0	0	1
Piedmont	2	1	0	0	0	1	4
Salzburg	2	1	1	1	1	0	6
Veneto	3	1	0	0	2	1	7

Source: Data provided by the partners

In general, regions from the Quadrant I (s. Fig. 10) apply almost 50% more instruments than those from the Quadrants II and III (except Upper Austria with a high number of policy instruments). The most striking feature of Fig. 12 is the difference in the focus of each of the policy instruments.

Regions in Quadrant I support **workforce development** much more than other regions which accompany it with efforts in **technology transfer and support of new companies** (Fig. 12). Regions in Quadrant II focus strongly on **cross-regional cooperation**, whereas regions from Quadrant III are comparable to others focused on **cross-regional collaboration** combined with **support, RDI or networking / clustering**. It should be pointed out that there is only a difference in terms of focussing on regional policy instruments. Regions in Quadrant I publicly invested a total amount in RDI which is much higher than that of all others (s. Fig. 2). They also provide a high number and high variety of other policy instruments needed to trigger transformative actions.

**Fig. 13: Relative intensity of policy instruments applied among the partner regions**



Even more striking findings arise from the fact that in comparison, Baden-Württemberg provides the highest support for the generation of new firms and workforce development, whereas Bavaria is leading in technology transfer programmes. Franche-Comté invests in RDI and Piedmont in cross-regional collaboration and internationalisation, while the Veneto region provides dedicated support to clustering and networking.

### 3. Strategic Alpine Space Areas for Cross-regional Cooperation

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Defining Strategic Alpine Space Areas for Cross-sectoral Cooperation involves the identification of those areas where one can expect the highest impact of cross-sectoral cooperation on competitiveness and industrial and academic leadership for the individual Alpine Space regions as well as for the macro-region itself. In this case, cross-sectoral cooperation is seen as tool rather than an objective. Consequently, those Strategic Alpine Space Areas are of highest relevance:

- They contribute to the **EU Strategy for the Alpine Region** (macro-regional level).

The EU Strategy for the Alpine Region (EUSALP) was published on 28 July 2015 in the Communication and the Action Plan on the EU Strategy for the Alpine Region. The implementation of the Strategy is based on the key principles applied to the existing macro-regional strategies: no new EU funds, no additional EU formal structures and no EU legislation. These conditions require a coordinated approach, synergy effects and a more effective use of existing EU funds and other financial instruments. The EUSALP will affect around 80 million people living in 48 regions in seven countries. Of these, five are EU member states (Austria, France, Germany, Italy and Slovenia) and two are non-EU countries (Liechtenstein and Switzerland).

EUSALP covers the following thematic policy areas:

- Economic growth and innovation,
- Mobility and connectivity,
- Environment and energy.

The Strategy is designed to help the Alpine Region cope with major **challenges**, such as:

- **Economic Globalisation** that requires the region to distinguish itself as competitive and innovative by developing a “knowledge and information” society,
  - **Demographic Trends** characterised particularly by the combined effects of ageing and new migration models,
  - **Climate Change / Energy Change** and its foreseeable effects on the environment, biodiversity and on the living conditions of its inhabitants,
  - Its specific geographical position in Europe as a **Transit Region** and as an area with unique geographical and natural features which will set the frame for all future developments.
- Areas of **common interest** for the Alpine Space Regions can contribute to the goals and objectives defined within the individual S3. Most of the Alpine Space regions are highly developed and competitive but many are comparably small in terms of industrial agglomeration or are lacking a strong base of traditional or emerging industries (s. Fig. 10). Thus, for regions located in the Quadrants II and III, cross-regional cooperation in those PAs is of fundamental interest where a combination of respective PAs can lead to new transformation actions and the emergence of industries from which all involved regions benefit.

Consequently, five Strategic Alpine Space Areas have been identified that meet both requirements described above. It systematically takes into account that transformative actions mainly happen between two or several PAs.

### 3.1 Strategic Alpine Space Area to Cope with Economic Globalisation

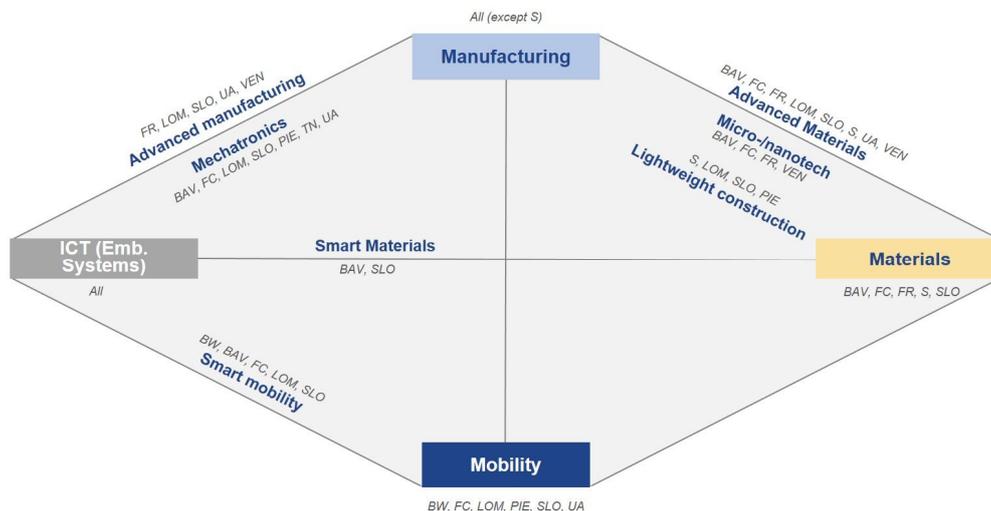
Alpine Space regions are strongly exposed to globalisation, especially in the field of Manufacturing. The added value of Manufacturing to GDP ranks between 11 % (France) and 23 % (Germany and Slovenia). Industry 4.0 and increased logistics allow enterprises to manufacture all over the world. Thus, it is no surprise that most partner regions cited Manufacturing as one of the key PAs to invest in science, technology and innovation in order to remain internationally competitive.

However, Manufacturing is not a stand-alone sector. There is a strong convergence between Manufacturing and others such as Materials, ICT and Mobility, all of which are also defined as PAs by most of the partner regions. ICT-enhanced Manufacturing will lead to the digitalisation of industries. New industrial mobility concepts allow enterprises to produce wherever they want. All of these trends are drivers for Economic Globalisation. Regions like Bavaria, Baden-Württemberg, Espace Mittelland and Zurich are European hotspots in Digital Industries with significant strengths in one or more PAs<sup>17</sup>.

Fig. 14 represents the **S3 Synergy Diamond** targeting the EUSALP challenge of **Economic Globalisation**. The partner regions defined at least two PAs in their respective S3. In addition, many Alpine Regions have defined Specialisation Areas, or Areas of Application which emerge from one or several PAs and thus can be grouped at the edges of the **S3 Synergy Diamond** between two of the four PAs. They represent areas where significant transformative activities are happening or areas that are expected to create emerging industries very soon. Examples are

- Advanced and Adaptive Manufacturing,
- Mechatronics,
- Lightweight Construction,
- or Smart Mobility.

Fig. 14: S3 Synergy Diamond targeting the EUSALP challenge: Economic Globalisation



<sup>17</sup> European Cluster Panorama 2016, <http://ec.europa.eu/DocsRoom/documents/20381>.

Cross-regional cooperation focussing on the Specialisation Areas or Areas of Application at the edges of this S3 Synergy Diamond will bundle complementary regional strengths, competences and efforts. All partner regions can benefit from this. Successful cooperation will contribute at the regional level as well as on the EUSALP level.

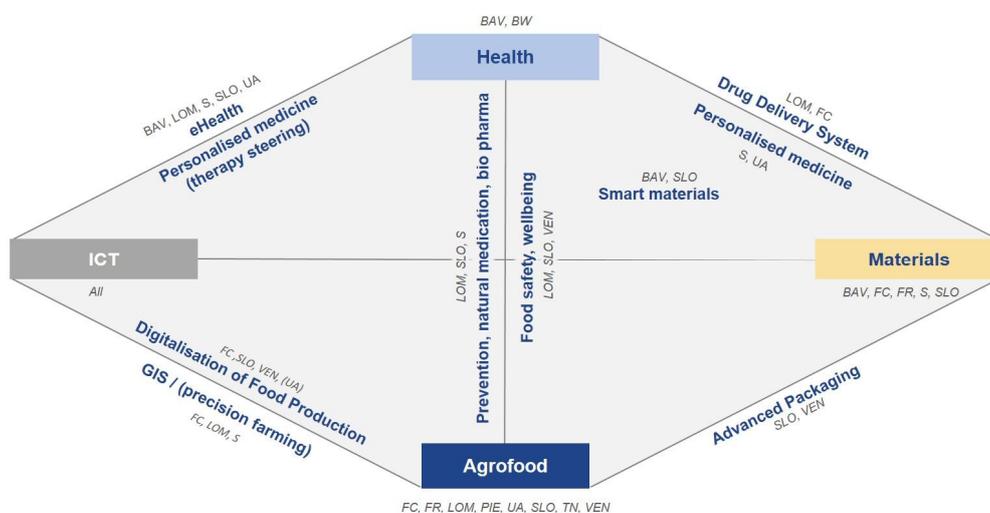
### 3.2 Strategic Alpine Space Area to Cope with Demographic Change

The S3 Synergies Diamond of Demographic Change can be defined in a similar way like that of Economic Globalisation. PAs like Health, ICT, Agrofood and Materials are high on the agenda of most project partners' regions and are all directly or indirectly connected to demographic change. They can be considered as important sources where innovative products and services will lead to new solutions to cope with Demographic Change. Regions also identified Specialisation Areas or Areas of Application within the S3 where significant transformative activities are ongoing, emerging from one or several PAs:

- E-Health or personalised medicine will contribute to a better life for elderly people.
- Prevention instead of therapy will help to reduce the cost of the public health system.
- Increased food safety, functional food and smart packaging will contribute to a healthy nutrition and better focus on the needs of the older population segments of society.

Fig. 15 represents the **S3 Synergy Diamond** targeting the EUSALP challenge of **Demographic Change**, built on four corner points representing the PAs Health, ICT, Agrofood and Materials, which are high on the agenda for most partners' regions.

**Fig. 15: S3 Synergy Diamond targeting the EUSALP challenge: Demographic Change**



### 3.3 Strategic Alpine Space Area to Cope with Climate Change

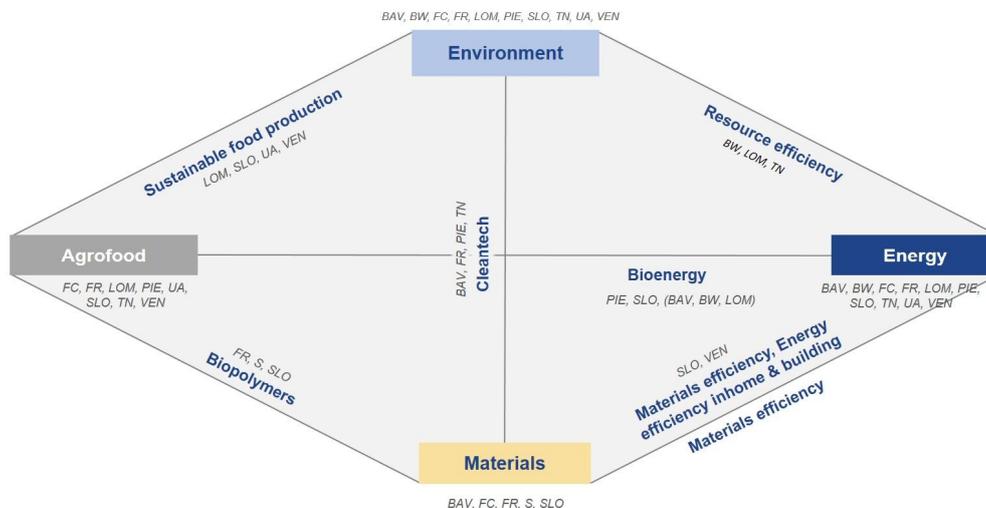
Over the last century, global warming has caused all Alpine glaciers to recede. In 2006, the volume of water stored as ice was still almost 10 % greater than the water present as liquid. However, the margin is continuing to narrow<sup>18</sup>. Global warming will also bring about changes in rain and snowfall patterns. Additionally, it will bring an increase in the frequency of extreme meteorological events such as floods and avalanches. Thus, climate change in the Alpine Space Region is one of the major challenges.

Progress in the development of PAs like Environment, Energy, Agrofood and Materials can contribute to better cope with Climate Change. This is the reason why the majority of the partners' regions' S3 include this focus in their PAs. There are many transformative activities emerging from one or several of these PAs, such as:

- Sustainable food production,
- Bio-based industry,
- Resource efficiency,
- Energy efficient construction.

Fig. 16 represents the **S3 Synergy Diamond** targeting the EUSALP challenge **Climate Change**. Cross-regional cooperation, based on regional strengths, can significantly contribute to finding new solutions and products to work against Climate Change and can help meet their S3-related objectives.

**Fig. 16: S3 Synergy Diamond targeting the EUSALP challenge: Climate Change**



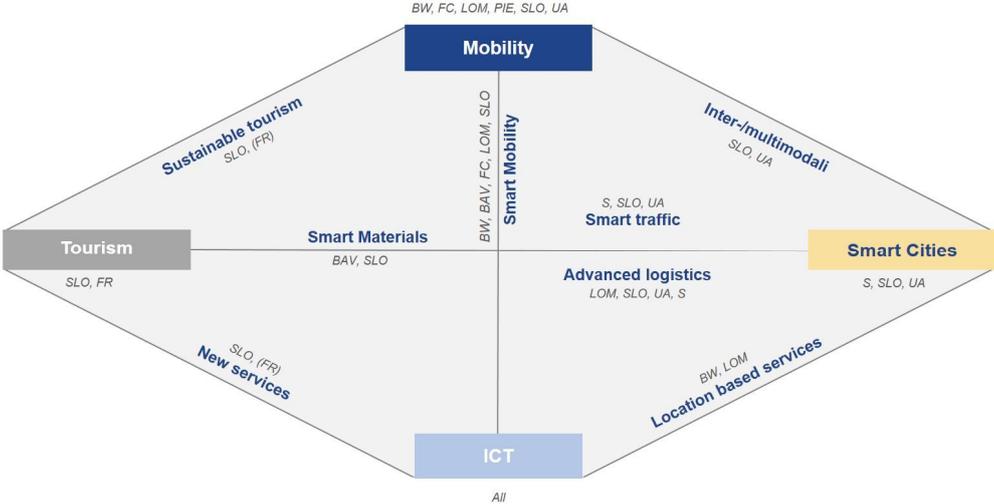
<sup>18</sup> Global Warming in Alps, WWF 2013, [http://wwf.panda.org/what\\_we\\_do/where\\_we\\_work/alps/problems/climate\\_change/](http://wwf.panda.org/what_we_do/where_we_work/alps/problems/climate_change/).

### 3.4 Strategic Alpine Space Area to Shape the Transit Region

The Alpine Space Region is an extremely sensitive environment. Special geographical features cause particular constraints regarding accessibility and transport infrastructure. Transport, as it is currently practiced, is one of the main causes of climate change. Almost 30 % of all greenhouse gases in the Alpine regions can be attributed to transport. Both passenger and freight traffic volumes are rising continuously. Road transport, in particular, causes negative externalities such as air pollution, noise and traffic congestion. This makes Mobility one of the biggest challenges for the social, economic and ecological development of the Alpine regions.

Consequently, Mobility and related PAs such as Tourism, Smart Cities and ICT / Digitalisation are high on the agenda of almost all partners' regions' S3. A coordinated cross-regional approach giving way to innovative solutions can tackle this challenge and ensure a sustainable development for the Alps. The **S3 Synergy Diamond targeting the EUSALP challenge of the Transit Region** can be depicted as shown in Fig. 17.

Fig. 17: S3 Synergy Diamond targeting the EUSALP challenge: Transit Region



## 4. The Way Ahead

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The analysis of the S3 of the project partners' region confirmed the essence and validity of S3 as a policy process which depends on many determinants. Our study helped to confirm that regions in the Alpine Space area are sufficiently different so as to not be entirely comparable. However, they do focus on many similar PAs, which is a good common ground to jointly tackle Alpine Space related challenges. It also provides a common ground for cross-regional cooperation. One of the concerns is that cross-sectoral cooperation is often initiated by policy makers and therefore can lack effective demand from the industrial side.

This report clearly outlines why and in which areas the Alpine Space Regions shall engage in cross-regional cooperation. Both Baden-Württemberg and Bavaria are characterised by technology research and commercialisation associated with life sciences and mobility. This has been the situation for decades if not an entire century. In the next step, it would be interesting to identify particular locations within both regions that are characterised by the highest transformative concentration. Lombardi is much more characterised by technology-based entrepreneurship. Information on private spending on technology might provide better insight into the Lombardi dynamic. Some other regions within Alpine Space regions are highly specialised in some areas, but often lack critical mass in terms of the broader perspective. Since transformative activities are mainly occurring between different traditional industries, smaller regions without a strong and broad industrial base are less likely to succeed in developing a significant number of emerging industries in regions like Bavaria or Baden-Württemberg. Cross-regional cooperation and bundling of different traditional sectors can represent a good approach to the creation of critical mass.

The five S3 Synergy Diamonds identified clearly where regions can benefit from cross-regional cooperation and where they represent a promising scope for cross-regional cooperation. The diamonds consistently place four prevailing PAs in the centre, where a significant number of transformative actions can happen at the edges between the PAs.

Since there are just no dedicated cross-regional support schemes in place, the key question is how to best proceed in order to harvest the huge potential for cross-regional cooperation among the Alpine Space regions. Two main actions are needed:

- Implement entrepreneurial discovery exercises as activities that are important design principles to further identify what transformative actions shall be supported by the project partners' regions<sup>19</sup>. Entrepreneurial discovery exercises applying such S3 Synergy Diamonds provided quality, fact-based inputs. They served to guide the discussion towards the main prevailing transformative actions which are of interest to the regions<sup>20</sup>. Based on the region-specific finding, cross-regional entrepreneurial discovery workshops (cEDW) must be conducted to match the preferences of the project partners' regions. Such exercises shall also contain a common discussion of what policy instruments are most suitable for in terms of supporting cross-regional cooperation.
- Develop policy framework conditions that enable and facilitate cross-sectoral cooperation. The current approaches which rely on Horizon 2020 or the INTERREG funding scheme are not entirely appropriate. By means of synchronising a policy instrument towards a synchronised scheme within the Alpine Space region, framework conditions can be created that serve to

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<sup>19</sup> Coffano, Monica/Foray, Dominique, 2014: The Centrality of Entrepreneurial Discovery in Building and Implementing a Smart Specialisation Strategy, Scienze Regionali, Vol. 13/1, pp. 3350.

<sup>20</sup> The S3 Synergy Diamonds have been applied in connection with entrepreneurial discovery processes in Munich (Bavaria), Linz (Upper Austria) as well as in Milano (Lombardy) in the period of March – May 2017.

provide a compatible environment for transformative actions across regions consistent with the different needs of the participating regions. The Synchronised Call scheme can focus on those transformative actions which are of common interest (based on the findings of the cEDW) and where critical mass of industry and academia can be created by bundling regional strengths. The precondition is the identification of transformative actions that cross borders and actors that are eager to establish linkages and working relationships.

For purposes of providing a comparative view of how cross-regional cooperation can serve to broaden and diversify options for economic development, it is of interest to review examples from outside the Alpen Space region. There are other macro-regions, like the Baltic Sea Region, that have already proceeded in this manner. They implemented the so-called Innovation Express Call<sup>21</sup> scheme that facilitates cross-regional cooperation. It is a common approach for supporting internationalisation of enterprises driven by cluster initiatives. It is based on a joint call coordinated by BSR Stars partners in collaboration with the Nordic Council of Ministers. It also allows regions like Baden-Württemberg and Catalonia to participate. Cluster organisations apply on behalf of their cluster actors to their respective 'home' funding agency in accordance with regional funding procedures. The advantage is that all partners receive funding. This good practice shows that moving forward is more a question of political willingness to make real use of the Alpine Space macro-regional approach. There is no lack of real opportunities.

A case description of the cluster-building experience in Massachusetts, USA is provided in the appendix to this report. The state of Massachusetts, with a population of about 5 million, is a global hot spot of innovation in life sciences. This case reflects some of the similarities among inter-regional, intra-regional and intra-state flows of resources stemming from inter-industry cooperation and innovation efforts. The case can provide certain benchmarking considerations for the Alpine Space regions towards smart diversification. In last decade in average Massachusetts institutions received more than \$1,2 billion in competitively awarded grants from National Institute for Health (Federal level)<sup>22</sup>. In addition, the Life Science Center managed a \$1 billion EUR initiative (state level, 10 years) which offers several incentives programmes from research grant to workforce development. For the past two years, the Massachusetts Life Sciences Center's (MLSC) competitive tax incentive program has focused on increasing regional diversity of the Massachusetts life sciences sector. As a recent activity, the Massachusetts Administration announced more than \$19 million competitive tax incentive awards to 22 life sciences companies from across Massachusetts. Only in 2015 Massachusetts received \$2 billion in 2015 venture capital. Due to the length and extent of its content, the case is presented in the appendix.

In the next phase of the project, a more detailed benchmarking exercise between the S3-4AlpClusters region and other macro-regions (including global hot spots of innovation) will be included. This can provide a more detailed review of possible peer macro-regions and hot spots of global innovation. The next phase will explore certain regional economic development strategies and approaches that might be recommended for the next phase of the project. In particular, it will offer additional insight on regional actors and on the dynamics of cross-regional relationships. We have found that these regional comparisons can be powerful motivators for change; helping to bring business and community leaders into a process of joint development and joint implementation.

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<sup>21</sup> for further details [www.bsr-stars.eu/innovation-express/](http://www.bsr-stars.eu/innovation-express/)

<sup>22</sup> 8 of the top 14 NIH-funded independent hospitals are in Massachusetts. In Europe hospitals are not considered as an major innovation actors. The State of Massachusetts general received almost \$350 mio in 2014.

# Appendix: Comparative Perspectives on Cross-regional Cooperation: The Case of Massachusetts, USA

For purposes of providing a comparative view of how cross-regional cooperation can serve to broaden and diversify options for economic development, it is of interest to review examples from outside the Alpine Space region. The following case example derives from the cluster-building experiences in Massachusetts, USA. This case reflects some of the similarities represented by both inter-regional (intra-state) and intra-regional (intra-state) flows of resources stemming from inter-industry cooperation and innovation efforts.

**From Route 128 to a world leading Life Science Cluster:** Perhaps one of the better recognised areas of technology-based development in the Commonwealth of Massachusetts is Route 128, the 65-mile stretch of highway surrounding Boston and Cambridge. Often compared with California's Silicon Valley in terms of its prolific generation of advanced electronics and software companies, Route 128 benefitted from the commercial spinoffs stemming from the US federal government sponsored research at top Massachusetts universities. Located between the greater Boston metro-west region and the central part of the state, Route 128 can be said to represent the commercial outcome of intra-state cross-regional cooperation. The current-day configuration of high-tech industries along Route 128 reflects products that have benefitted from the rapid advancements in microelectronics applications to healthcare and life sciences.

**Growth of life sciences:** The impressive growth of the life-sciences cluster in Massachusetts can be traced to the world-class standing of the research hospitals associated with the top universities and related brain pool in the state. Enabled by highly competitive federal research funds from the National Institutes of Health (NIH) and related agencies, the life-sciences sector in Massachusetts has thrived with continuing innovations in medical devices, robot-assisted surgery, bio-pharmaceuticals, diagnostic tools, telemedicine, digital medicine and other sub-fields.

**Regional context:** The global nature and dynamics of technology research and commercialisation activities associated with the life sciences are well recognised. However, it is necessary to acknowledge the types of local conditions associated with regional clusters where such activities take place. In Massachusetts, the regional development context is constantly changing and evolving in accordance with the growth stages and diversification of the knowledge-based industries. In terms of the life sciences, a good portion of the activity is concentrated in the Boston / Cambridge area in the eastern region of the state and has been steadily increasing in the Worcester area in the central region of the state. The evolving development of high-performance computing capacity and materials science in the western part of the state provides yet another contribution to the intra-state cross-regional synergy.

**Regional actors and their working relationship:** To put these cooperation dynamics into perspective, one must recognise the regional actors and the sectors that comprise the governmental, academic, industrial and general public in Massachusetts. Each of these sectors can be further disaggregated into distinct levels and types of entities. In the government sector, there are federal, state, municipal and regional agencies. In the case of the federal government, the federal procurement policies have greatly benefited Massachusetts over the years in areas associated with technology advancement in electronics, software and control systems. The federal government's Small Business Innovation Research Programme is associated with several different federal agencies and has made an important contribution to the state.

**Support infrastructure for enabling healthcare-related entrepreneurship in Massachusetts:** In the academic sector, there are universities, community colleges, research institutes, teaching hospitals and technical schools. Each of these levels plays a significant yet distinctive role in human resource development and capacity building. In the industrial sector, it is relevant to consider distinctive innovation-related roles played by large, medium and small firms, service providers, commercial R&D, manufacturing and business associations. To understand the role of the general public as a sector, it is helpful to stratify the various “publics” according to the particular technology issues they focus on and their respective levels of activism.

**Structural-functional adaptations for inter-industry dynamics:** Another key consideration in observing the environment for life science development in Massachusetts is that the above-named sectors have dynamic interactions that cut across organisational boundaries and evolve over time. In this regard, certain structural and functional adaptations can be observed in each sector. At Massachusetts universities, for example, some of the structural adaptations have involved the creation or expansion of technology licensing offices, patent policies, conflict of interest provisions, industrial liaison offices and others. Some of the adaptations at the state government level have included the formation of dedicated offices and programmes for innovation stimulation, special fiscal instruments, locational incentives as well as workforce development. In the area of workforce development, a particularly important legislative measure on the part of the public sector has been with regard to adjusting the “non-compete” provision in the state law. Such a provision previously inhibited the ability of qualified professionals to accept a position with a competing company within a certain period after leaving the former company. Other adaptations that can be observed in the private sector include the creation of specialised trade associations, industry consolidation, partnerships with large industry, proliferation of professional services and more.

**Inter-industry dynamics:** General workforce development in Massachusetts has been driven in large part by the nature of the types of industries in the state. In addition to selected areas of life sciences such as biopharmaceuticals, diagnostics and medical devices, these have included others like aerospace, defence, semiconductors, computers, and related fields. Certain well-known anchor companies have served Massachusetts in this regard. It is recognised that the vertical integration of industries like those mentioned above has been changing over the last several decades. Because these industries deal in products with high proprietary content, high knowledge content and high information content, they require advanced skills levels, high product quality and rapid response to market trends. The larger companies have continuously increased the outsourcing of much of their production and have increasingly relied on suppliers to drive the innovation process. It is important to consider how knowledge and sources of innovation flow between key participants within the manufacturing innovation ecosystem.

**Critical enabling factors for life sciences research, development and commercialisation:** Cross-regional flows of qualified human resources have greatly contributed to the presence and growth of a solid and growing core of qualified labour force in the life sciences in Massachusetts is considered to be a key enabling factor for the success of the sector. The pool of highly trained men and women involved in upstream research represent a wide variety of basic and applied disciplines. Similarly, as the life science cluster has expanded and diversified, new professional disciplines are now represented in downstream activities of bioprocessing, separations, quality control / quality assurance and others.

**Key actors and drivers involved in human capital formation:** Massachusetts is home to 114 colleges and universities, many of which are among the top-ranked research universities in the country as well as internationally. In addition to providing leading-edge training and education to the region’s human resource base, these university institutions are engines of novel discoveries in virtually every field of science engineering and technology relevant to today’s competitive global challenges.

As engines of continuous innovation, selected universities and research hospitals in Massachusetts and New England have been the source of new start-up companies, many of which have grown to be significant players in the state's innovation economy. Other regional actors include trade associations and professional services such as lawyers, accountants, investment community, press and communications media, public interest groups and patient advocacy groups. While this is only a partial list, the important observation here is with regard to the regional diversification of the groups and their respective roles within the innovation community.

**Policy Instruments and state grants.** In the area of public support for biomedical innovation in the Commonwealth's policy is to make special efforts to reach out to **all** regions of the state. The Massachusetts Life Sciences Centre (MLSC) is among the highest profile state sponsored initiatives. This Centre manages a EUR 1 Billion Life Sciences Initiative which offers several incentives programmes. The Cooperative Research Grant programme is designed to support industry-university cooperation. Through a competitive process, these university grants of EUR 220,000 per year for up to three years require that the industry partner provide a matching amount. The Accelerator Loan Programme can provide up to EUR 650,000 early-stage life science companies to help obtain investment capital. Additional programmes of this agency are designed to enable internships at companies and others are designed to provide tax incentive benefits on the basis of projected job creation impact of applicant companies. Other general tax credit programmes are also available to qualified companies through the Massachusetts Technology Collaborative and MassDevelopment. In all cases, intra-state cross-regional cooperation has served to support joint efforts toward the development of sustainable clusters and value-added chains of productive economic activity.

# S3-4AlpClusters in a nutshell

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*Smart Specialisation with Smart Clusters*



Smart Specialisation Strategies (S3) are a lever of EU Cohesion Policy. One of the biggest challenges is to make use of the interplay between S3 and clusters. How can S3 be used to foster innovation processes and spark entrepreneurship within clusters? How can S3 be implemented through clusters to gain sustainable and inclusive growth? There is a lack of experience among regions on how to use clusters in the implementation of S3 and how to develop implementation tools to fully benefit SMEs. In addition, alignment between and knowledge about other regions' strategies are very limited.

This is exactly the focus of the S3-4AlpClusters project, which believes that the interplay between S3 and clusters is an innovative approach that could spread innovation in the whole Alpine Space. S3-4AlpClusters will launch cross-regional coordinated actions between the different sectors/regions involved and enhance transnational cluster cooperation. The final aim is to generate critical mass for SMEs and to improve the framework conditions for innovation in the Alpine Space.

S3-4AlpClusters will develop:

- ✓ A joint transnational cluster action plan to improve transnational, cluster-based cooperation
- ✓ An S3-based innovation model for cluster development
- ✓ A fully synchronized call scheme
- ✓ New services validated by pilot clusters

The S3-4AlpClusters community includes cluster managers, entrepreneurs, academics and policymakers, and is supported by public authorities and S3 experts.

## The NUMBERS of S3-4ALPCLUSTERS

**15** Partners

**35** decision makers

**9** Observers

**11** Alpine Regions

**830** SME

**10** pilot clusters to be involved

FOLLOW S3-4AlpClusters

[www.alpine-space.eu/projects/s3-4alpclusters/en/home](http://www.alpine-space.eu/projects/s3-4alpclusters/en/home)



## S3-4ALPCLUSTERS Partners

HES-SO // FR-HEIA-FR INNOSQUARE CLUSTERS



Business Upper Austria - OÖ Wirtschaftsagentur GmbH



ClusterAgentur Baden-Württemberg



Veneto Region - Research Clusters and Networks Unit



Poly4EMI hosts by Anteja ECG d.o.o



Innovation and Technology Transfer Salzburg GmbH



University of Franche-Comté - FEMTO-ST



PROPLAST - Consortium for the Plastic Culture Promotion



Cluster Technologies for Smart Cities & Communities Lombardy Foundation



Autonomous Province of Trento (PAT)



Trentino Innovation Hub



Lombardy Region Government



Bavarian Research Alliance GmbH



Government Office for Development and European Cohesion Policy



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