
The prospective comparative analysis of the national Smart Specialisation Strategies in Central Europe

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Outline

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- Findings from the analysis of selected thematic priority areas and assessment of potential cooperation
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Main objectives

- Main objective: to maximise the economic performance by taking advantage of economies of scale in common areas of R&D&I.
- Specific objectives of this assignment are:
 - *to identify whether there will be sufficient common areas of potential cooperation in the area of R&D and innovation between the concerned Central European (CE) countries and regions;*
 - *to provide recommendations for the set-up of governance models as a framework for a more efficient and enhanced cooperation platform; and*
 - *to make recommendations for follow-up activities.*
- Geographical coverage: Czech Republic, Slovakia, Hungary, Poland, Slovenia, Croatia, Austria (Burgenland, Steiermark), Germany (Saxony, Bavaria).
- Analysis performed based on a desk research and the existing databases and mapping tools.
- Work undertaken during the period 20 May - 28 September 2016.

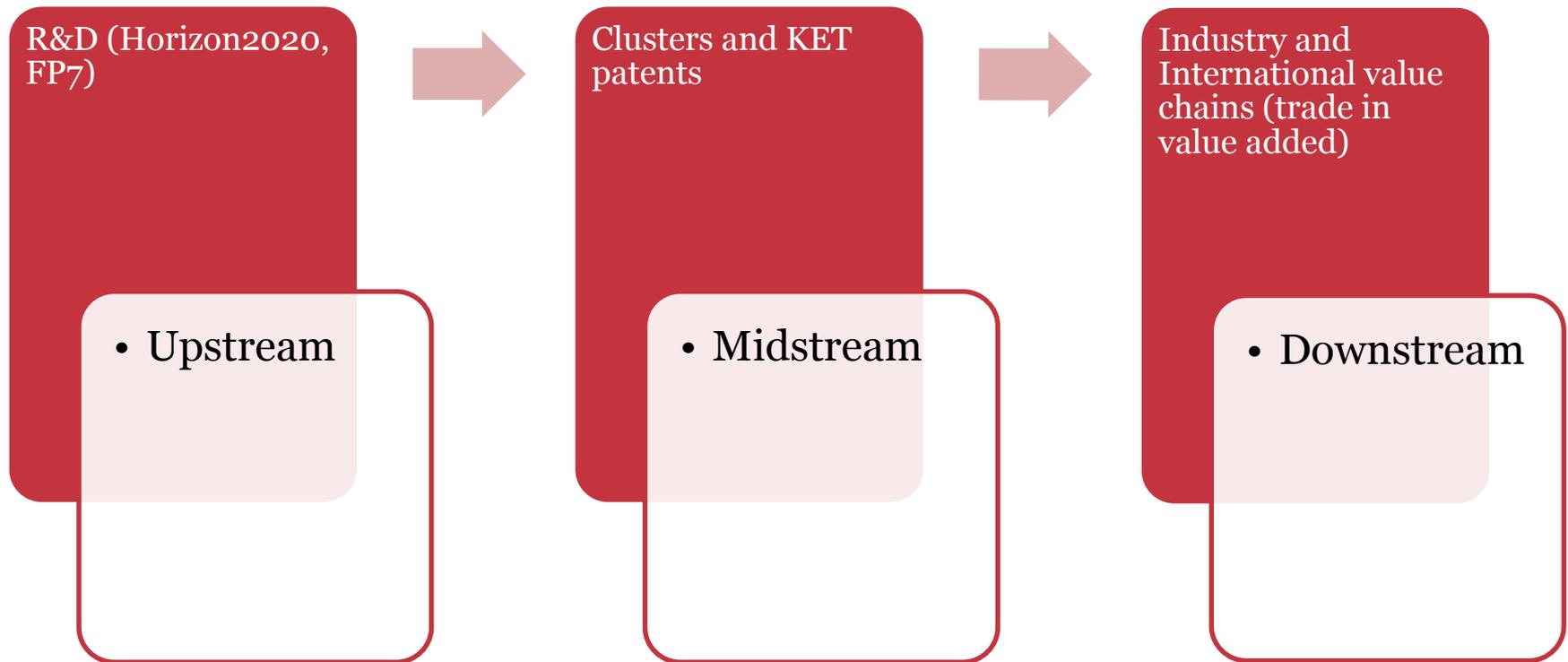
Methodology

- S1: Group priorities from CE S3 strategies (EYE@RIS3 database) into initial **relatively coherent technology priority areas (TPA clusters)** based on revealed similarity of areas > double checked with S3 strategic documents and resolve discrepancies > 18TPAs.
- S2: **Group data on R&D and innovation capacities** into TPA clusters from S1 based on stage of **innovation chain (upstream, midstream and downstream)**.
- S3: Based on S1-2 agree on the list of TPAs which have the greatest potential for inter-regional linkages (**from 18 to 7 TPA**).
- S4: Based on the list of agreed TPAs with the greatest potential for inter-regional cooperation write up **summaries of selected thematic areas and collect data on key stakeholders** in the respective TPA (firms, R&D organizations, universities).

Initial list of 18 common S3 thematic priority areas of the CE countries/regions

1	ENERGY & ENVIRONMENT
2	ICT & ELECTRONICS
3	PUBLIC HEALTH & MEDICINE
4	AGRO-BIO-ECONOMY
5	TRANSPORT & MOBILITY
6	ELECTROTECHNICAL AND MECHANICAL INDUSTRIES
7	ADVANCED MANUFACTURING SYSTEMS
8	NEW MATERIALS
9	LIFE SCIENCES
10	SECURITY
11	TOURISM
12	BIOTECHNOLOGY
13	SMART CITIES AND COMMUNITIES
14	CONSULTANCY
15	NANOTECHNOLOGY
16	WOOD TECHNOLOGIES
17	CHEMICAL TECHNOLOGIES
18	PHOTONICS
19	OTHER

Identifying regional/national strengths in different areas of innovation value chain



Policy priorities

TPA/ Geographical coverage	CZ	SK	HU	PL	SL	HR	Burgenland	Steiermark	Saxony	Bavaria
Energy and environment	✓ ris3	✓ ris3	✓	✓	✓	✓	✓	✓	✓ ris3	✓
Public health, medicine and life sciences	✓	✓ ris3	✓	✓	✓	✓	✓	✓	✓	✓
Agro- and bio-economy	✓ ris3	✓ ris3	✓	✓	✓	✓	✓	✓	✓ ris3	✓ ris3
Advanced materials and nanotechnology	✓			✓	✓ ris3		✓	✓	✓	✓
Transport and mobility	✓	✓	✓	✓	✓	✓		✓	✓ ris3	✓ ris3
Advanced manufacturing systems	✓			✓	✓		✓		✓	✓
ICT and electronics	✓	✓	✓	✓			✓		✓	✓

Definition of priorities in RIS3

- **Energy and environment:** *energy, environment industries or broadly defined transformation into a circular or sustainable economy, also useful to distinguish between fossil fuels producers, renewable producers, and environmental industries and services*
- **Public health, medicine and life sciences:** *medicine and medicinal products to broadly defined health and well-being and to focus on life sciences and biotechnology.*
- **Agro- and bio-economy:** *bio-economy is a broad term in itself, which encompasses any activity associated with the use of biotechnology, bioprocesses and bio-based products, aimed at the production of goods and services.*
- **Advanced materials and nano-technology:** *material science, advanced materials in various industrial applications (automotive, aerospace, mechanical engineering, medical technology, wind power, etc.), technical textiles, multifunctional materials and composites, lightweight structural materials and composites.*
- **Transport and mobility:** *mobility, green transport, environmental friendly transport solutions, automotive and mechanical engineering industries, e-mobility and energy storage systems, niche components and systems for combustion engines, advanced vehicle structures, intelligent transport system.*
- **Advanced manufacturing systems:** *robotics, automotive engineering, mechatronics, advanced production technologies, optimisation and automatisisation of production processes, control equipment.*
- **ICT and electronics: micro-electronics** *cyber-security, e-health, e-government, cyber-physical systems, IT services and software, electronics, electrical engineering, and smart city.*

Energy and environment

- Three distinctive sub-areas:
 - *Fossil fuels producers (oil, coal, gas),*
 - *Renewable producers (photovoltaics, the wind, biomass, hydropower), and*
 - *Environmental industries and services.*
 - Each of these areas operates in different modes of innovation, have somewhat different knowledge bases and market structures.
 - Eastern Central European economies are lagging behind in renewable energy sectors both regarding RDI and application.
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Energy and environment

Sub-area	Potential of cooperation	Further information
Traditional (fossil) energy technologies incl. Power engineering	Not a priority	Large established players. The capacity to 'kickstart' cooperation is beyond the capabilities of the CE S3 stakeholders.
Renewable energy (wind, PVC, biomass)	Strong priority	Strong and rising demand coupled with the need for diversification into new energy areas. Also, the opportunity to establish CE supply chains linked to technology upgrading.
Environmental services	Moderate priority	Solid and rising demand but very different levels of development among countries/regions represent an excellent opportunity for knowledge exchange. Working groups should explore whether it should be macro or specific innovation focused cooperation.

Public health, medicine and life sciences

- The opportunities for inter-regional cooperation differ sharply between **pharma, biotechnology and medical devices**.
- In all three areas, **Bavaria** is a very strong leader, and other regions have competencies specific **niches** of each of these areas.
- Intra-regional CE cooperation in **pharma would be better realised within the existing EU initiatives**. > the European Innovative Medicines Initiative (IMI).
- **Medical biotechnology** : potential for synergies among various activities of universities and their spinoffs in this area.
- **Industrial biotechnology** : a new area where public sector organisations and their spinoffs are less present compared to medical biotechnology. > the potential to integrate product improvements with pollution prevention > an area where latecomers like East CE regions/countries could embark in international cooperation as a way to acquire knowledge.
- **Medical devices** : already developed in segments in Hungary and niches in other CE regions while Bavaria is again the leader in the area.

Public health, medicine and life sciences

Sub-area	Potential of cooperation	Further information
Biotechnology (medical and industrial)	Very high priority	Very promising technology area where CE needs to invest more. Developed R&D capacities in health and unrealised opportunities in medical biotech. Industrial biotechnology as new and emerging area which has not been given enough attention in national S3 strategies.
Medical devices	Moderate priority	Uneven development across CE but opportunities for establishing a regional supply chain. The outcome is highly dependent on coordinating a large number of poorly coordinated players.

Agro- and bio-economy

- **Moderate opportunities** for inter-regional cooperation for several reasons. Investments in R&D in this area are modest
- The clustering is quite uneven > largely downstream (market) oriented with **weak links to R&D**.
- Still, potential for cooperation is significant in **functional food, wood/forest sector and circular/ bio-economy**.

Agro- and bio-economy

Sub-area	Potential of cooperation	Further information
Functional food	Strong priority	A strong opportunity but also a necessity given the economic importance of food industry in CE. It would enhance so far poor cooperation between industry and R&D sector in CE.
Wood/forest sector	Moderate priority	The Large potential in parts of CE coupled with high trade interdependence. Cooperation should focus on improvements in the supply chain management with the aim to promote a shift from 'forest sector' to 'forest-based bioeconomy'. The biggest obstacle: a variety of national players with limited international cooperation experiences.
Circular economy/bio-economy	Strong priority	Potential regarding biomass and need to develop regional approach along the lines of EU Bioeconomy strategy. A large range of stakeholders which would be possible to organise provided that the cooperation is initially confined on dissemination of good practice and mutual learning.

Advanced materials and nanotechnology

- KET/interdisciplinary area: spanning the physics, engineering applications, manufacturing processes and nanotechnologies.
- Closing related to the automotive and aerospace sector.
- Overall strong priority.
- Highest potential of cooperation between DE and PL, CZ, SL and Steiermark.
- Sub-areas and potential topics of cooperation to be defined.
- One of the challenges lying ahead is to lower the production costs.

Advanced materials and nanotechnology

Sub-area	Potential of cooperation	Further information
A wide range of specific technologies	Strong priority	Potential impact on industries beyond the sectors driving the development of these technologies. Creative combination of technologies into new products.

Transport and mobility

- Overall high potential of cooperation especially in the automotive sector (significant concentration of companies).
- Highly globalised industry characterised by strong competition and Tier 2 suppliers face high pricing pressure.
- Links to other TPA: lightweight design, e-propulsion, use of latest electronics, Industry 4.0.
- The focus of future cooperation to be determined upon actual needs of relevant stakeholders.
- Main issue is the speed of implementing new technologies in the marketplace.

Transport and mobility

Sub-area	Potential of cooperation	Further information
Automotive	Strong priority	<p>A significant concentration of companies in automotive sector but a highly globalised industry with strong competition.</p> <p>The focus of cooperation to be determined based on actual needs of relevant stakeholders.</p>
Aerospace and Rail	Moderate priority	Upon actual needs of relevant actors.

Advanced manufacturing systems

- High concentration of companies driving the development of these technologies in Bavaria.
- A relatively high concentration of mechanical engineering industries in the CEECs.
- Headline topics of potential cooperation to be determined upon actual needs of stakeholders.
- Possibilities of applications in other areas than manufacturing (e.g. autonomous vehicles, energy management, in addition to various application in cities).
- Strong competition in specific automation technologies and Industry 4.0.
- Lack of short term profitability of Industry 4.0 investment, particularly for SMEs.

Advanced manufacturing systems

Sub-area	Potential of cooperation	Further information
Factory and process automation	Strong priority	Potential and added value for manufacturing and process manufacturing.
Industry 4.0 related solutions (cyber-physical systems)	Not a priority	Strong competition and still at early stage of development.
Data analytics, complex simulation, and modelling	Moderate priority	Availability of competencies in software systems engineering, communication.

ICT and electronics

- Some similarities with the area of advanced manufacturing systems. Digital technologies find applications in different business areas and not only in manufacturing and processing industry.
- Overall, the performance measured by patenting activities in the area of micro-, nano-electronics and photonics is relatively low (except Bavaria, Saxony and to some extent in Steiermark).
- An observable upward trend in ICT patenting activities in HU, PL, and CZ.
- High concentration of companies in Bavaria and moderate concentration in other CE countries and regions.

ICT and electronics

Sub-area	Potential of cooperation	Further information
<p>Intelligent transport systems Smart grids and energy networks New safety and security solutions</p>	<p>Strong priority</p>	<p>Considered a priority and relevant activities are undertaken in this field.</p> <p>The demand for programming and modelling methods, platforms and software and available competencies in these areas.</p>
<p>Photonics sensing technologies</p>	<p>Moderate priority</p>	<p>Activities undertaken by platforms at the national level.</p> <p>Area of activity important for optimisation of manufacturing and processing industry.</p>
<p>Micro and Nanoelectronics</p>	<p>Not a priority</p>	<p>Strong global competition in the semiconductor industry.</p>

Conclusions

- The study has done what is possible in analytical terms based on **desktop research and some limited interviewing**.
- When assessing the outcomes, it is important to bear in mind that study **could not go much beyond the evidence that is available in S3 documents** and thus shares all strengths and weaknesses of S3 analytical and decision-making processes in different regions/countries.
- Wherever it is possible, we have tried to complement data and information from S3 analyses and EU databases with **additional reviews of secondary literature**.
- The next step > verification of these results > their correction and clarification.



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