



StressTesting Regional Approaches Conducive to Implement S3 through Clusters

Synthesis Report

*Cross-clustering partnership for boosting eco-innovation
by developing a joint bio-based value-added network for the Danube Region*

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This report was produced within the frame of the DanuBioValNet project (Deliverable 4.1.2 StressTest Synthesis Report), co-funded by European Union funds (ERDF, IPA) through INTERREG Danube Transnational Programme. It was prepared by Dr. Gerd Meier zu Köcker (ClusterAgentur BW, Germany).

This report was drafted with inputs gathered from all project partners in the period from May until July 2018.

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For further information about the DanuBioValNet project, you will find a short description in the document. To learn more and to download additional resources please refer to the project website
<http://www.interreg-danube.eu/approved-projects/danubiovalnet>.

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LIST OF ABBREVIATIONS

ASP	Associated Strategic Partner
BSC	Balanced Scorecard System
ERDF	European Regional Development Fund
EU	European Union
Fig.	Figure
FTE	full-time equivalent
i.e.	that is (Latin: id est)
IPA	Instrument for Pre-Accession
JBCS	Joint Bio-based Industry Cluster Policy Strategy
LP	Lead Partner
p.	page
PP	Project Partner
RIS	Regional Innovation Strategy
SME	Small and Medium Enterprise
SRIP	Strategic Research and Innovation Platform
S3	Smart Specialisation Strategy

GLOSSARY

Bioeconomy	Bioeconomy is the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy. Its sectors and industries have strong innovation potential due to their use of a wide range of sciences, enabling and industrial technologies, along with local and tacit knowledge. (Source: European Commission (2012). <i>Innovating for Sustainable Growth: A Bioeconomy for Europe</i> , p. 3)
Cluster	Clusters are geographic concentration of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also cooperate. (Source: M. Porter (1998). <i>On Competition, Updated and Expanded Edition. Harvard Business Review Book</i> , p. 213)
Cluster initiative	Cluster initiatives are organised effort to increase the growth and competitiveness of a cluster within a region, involving cluster firms, government and/or the research community. (Source: Ö. Sölvell, G. Lindqvist and Ch. Ketels (2003). <i>The Cluster Initiative Greenbook</i> , p. 9)
Cluster organisation	By a cluster organisation one should understand organised efforts to facilitate cluster development, which can take various forms, ranging from non-profit associations, through public agencies to companies. (Source: PricewaterhouseCoopers (2011). <i>Uncovering excellence in cluster management</i> , p. 6) Cluster management can be defined as the organisation and coordination of the activities of a cluster in accordance with certain strategy, in order to achieve clearly defined objectives. (Source: PricewaterhouseCoopers (2011). <i>Uncovering excellence in cluster management</i> , p. 3)
Cluster participants	Cluster participants are representative's industry, academia or other intermediaries, who are commonly engaged in a cluster initiative. Given the case a cluster initiative has a certain legal form, like 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. Cluster policy is to be 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. (Source: European Commission (2016). <i>Smart Guide to Cluster Policy, Guidebook Series: How to support SME Policy from Structural Funds</i> , p. 11)
Eco-innovation	Eco-innovation aiming at significant and demonstrable progress towards the goal of sustainable development. Eco-innovation projects will therefore aim to produce quality products with less environmental impact, whilst innovation can also include moving towards more environmentally friendly production processes and services. Ultimately, they will contribute towards the reduction of greenhouse gases or the more efficient use of various resources. (Source: European Commission (2015). <i>Eco-innovation, When business meets the environment. FAQ: What is Eco-Innovation? Online</i>).
Programme	Programmes are a vehicle to implement a policy, e. g. 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. (Source: Foray (2015). <i>Smart Specialisation, Opportunities and Challenges for Regional Innovation Policy</i> , Routledge.)
Value Chain	The value chain describes the full range of activities that firms and workers do to bring a product from its conception to its end use and beyond. A value chain refers to the full lifecycle of a product or process, including material sourcing, production, consumption and disposal/recycling processes. This also includes activities such as design, production, marketing, distribution and support to the final consumer. (Source: University of Cambridge (2017). <i>What is a value chain? Definitions and characteristics. Online</i> .)

We will clearly distinguish between clusters, cluster initiatives and cluster organisations to make it easier to understand what is intended with the corresponding question.

SUMMARY

Most European Union (EU) regions have developed Smart Specialisation Strategies (S3) as integrated part of their regional innovation strategies. The challenge is to implement S3 through clusters in order to gain sustainable and inclusive growth while generating critical mass of economically viable activities. The DanuBioValNet project is aiming at establishing bio-based industry networks across the Danube region. The emerging transnational cooperation of clusters will foster bioeconomy and eco-innovations and lead to a strengthening of the regional economies.

Consequently, clusters as the strong representatives of a group of industries that are closely linked by common products, markets, technologies and interests are chosen to organise and bear the industry cooperation and creation of new value chains, because they are performant and sustainable partners and guarantee the upgradeability in the dimension industry, sciences and also politics. As implemented by clusters and cluster organisations, S3 can offer an innovative approach to improve innovation and value chain development in the Danube region. Cross-regional approaches can serve as support for coordinated actions between the different sectors/regions. Transnational cluster cooperation facilitates to close existing gaps in bioeconomy value chains.

Against this background, each of the partner regions of DanuBioValNet conducted a policy benchmarking (StressTesting) to ascertain how to implement S3 through clusters as individual benefit. Additionally, the StressTesting provided a joint benefit to the DanuBioValNet partnership by allowing a better understanding of each other's policy instruments. The StressTesting addressed policy making and implementation processes, namely the role of clusters in the design and implementation of the S3, regional support schemes for cluster initiatives, coordination and alignment of S3 at the regional and national level. Benchmarking also explores the role of a regional cluster excellence portfolio to provide inputs for development and testing innovation models initiated by cluster organisations and subsequently identifies areas for (common) improvements.

The present Synthesis Report summarises the findings of the partner regions' StressTest reports and provides reflections how to make more use of cluster-based approaches in implementing S3.

The main conclusions are:

- Cluster initiatives in the Danube region have been involved in the development process of S3, but it strongly varies between the regions
- Aligning S3 and related policy instruments with policies on national or on neighbouring regional level remains a challenge.
- There is a significant gap between S3 objectives and financial means of most Danube regions for proper implementation
- Lack of sustainable funding weakens cluster initiatives as tools to properly implement
- Cluster Initiatives contribute to S3 implementation in very different ways
- Monitoring and evaluation schemes are not yet adapted to the S3 approach
- Impact of S3 on operation of cluster organisations is still very low

Although cluster initiatives in the Danube region are high on the policy agenda and considered as tool to implement S3, the readiness on policy level to invest in them is comparably low. Weak or unstable public support schemes (and entire cluster policies) hamper the capabilities of cluster initiatives to follow the role given in the respective S3 as well as to deliver the requested support measures for the public and private sector. As a consequence, cluster initiatives in the Danube region tend to be smaller in terms of cluster actors, under critical in terms of full-time equivalent of the cluster management as well as low in terms of overall capabilities.

These findings raise concerns to what extent the cluster approach is fully understood and seriously turned into practice in the Danube region, since 75 % of the cluster initiatives are under-funded and lack financial stability. Additional interviews with cluster managers confirmed that due to this situation too much attention is given to assure financial stability in day-to-day business, and European projects are more considered as a very welcome financial source and less as a support scheme to internationalise.

When comparing the Danube region with other macro regions, it becomes clear that others, like the Baltic or the Alpine Region, are well ahead in systematically making use of clusters as a tool for regional development.

Future discussions about new ERDF funding period or cluster policy in the Danube region shall satellite more around the question, how the Danube region can follow a more systematic cluster approach and make more targeted use of the cluster initiatives as tool for regional development, incl. S3 implementation.

I. THE CONTEXT: INTERPLAY BETWEEN SMART SPECIALISATION AND CLUSTERS

Clusters are a fundamental part of the European industrial landscape as 38 % of European jobs are based in clusters. They are key drivers for the European economy with regard to competitiveness, growth and jobs. Over the last years, cluster policy in the EU has increasingly gained importance to improve competitiveness of local industries and to facilitate industrial transformation processes by stimulating the development of infrastructure in support of business innovation. The recent economic crisis and on-going global industrial transformations have highlighted the need to modernise regional industrial structures and build new industrial competences in order to respond to global competition and to address societal challenges, such as environment, health and resource efficiency.

Starting from the observation that the implementation of Smart Specialisation Strategies (S3) often fails to generate the desired effects, there is a strong need to better understand the relationship between S3 and clusters. The underlying problem in the implementation of S3 has been detected at two fundamental levels: a lack of experience among regions on how to use clusters in the implementation of Smart Specialisation Strategies and a lack of alignment between and knowledge about other regions' strategies.

The interplay between S3 and clusters implies a two-way relationship between the two concepts. On one side it is of relevance to look at how S3 can

be used to foster innovation processes and spark entrepreneurship within clusters ("S3 → Clusters"). Turning the relationship on its head, the existing clusters can also be used as a tool in the implementation of S3 ("Clusters → S3"). This consideration allows the StressTest focusing on different aspects of the interplay between S3 and clusters. Taking the above-mentioned into account, regions/countries should apply a broad set of policy instruments when implementing their S3 through clusters. History has shown that there is no single policy appropriate to cope with all regional challenges¹. This also leads the attention away from single clusters rather than to the **regional cluster portfolio**. A well-balanced, matured regional cluster portfolio is necessary to have capable clusters and cluster managements in place as tool to support the entrepreneurial discovery and identify those opportunities a region can benefit most.

Consequently, regions need

- strong clusters, since enterprises located in strong clusters have a higher growth rate and higher productivities².
- strong cluster managements that can provide higher impact in terms of innovation and competitiveness than weak ones³.
- a systematic implementation approach. If a region intends to use clusters as a tool to implement S3, it has to follow a thorough and systematic approach.

II. THE STRESSTEST APPROACH

StressTesting is a transnational benchmarking-based approach that enables an empirical review and assessment of regional policies for the implementation of Smart Specialisation Strategies (S3) through clusters. StressTesting determines how and where clusters can be most supportive for industrial transformation and growth in an integrated, coordinated and sustained manner. The overall aim is to develop new and better ways of designing and implementing modern cluster-based regional economic development policies. The approach draws maximum advantage from analysis of the regional cluster portfolio to better understand the forces that shape new industrial

value chains and sectors. StressTesting is intended for regional implementation organisations, policy makers and business development entities that are interested in comparing their own region with European frontrunner regions.

The StressTest and its related report will thus mainly focus on the question of how clusters are used as a tool of S3 and study the modality of use and influence of clusters in the implementation of S3. By including questions about the ability of cluster initiatives to implement new innovation models, the results of the StressTest will nevertheless also pave the way for another important question of how S3 can contribute to define new innovation

1) Izsak, Ketels, Lämmer-Gamp, Meier zu Köcker (2016): Smart Guide to Cluster Policy, European Cluster Observatory, Brussels, http://ec.europa.eu/enterprise/initiatives/cluster/observatory/cluster-mapping-services/services/index_en.htm.

2) Ketels, Protsiv (2013): Clusters and the New Growth Path for Europe. WWWforEurope Working Paper, WIFO, Vienna.

3) Lämmer-Gamp, Meier zu Köcker, Christensen (2012): Clusters are Individuals. New Findings from the European Cluster Management and Cluster Program Benchmarking, Danish Ministry of Science, Technology and Innovation, ISBN: 978-87-92776-22-8, Copenhagen/Berlin.

models in further detail. It thus fully considers the two-way interplay between clusters and S3.

StressTesting addresses both policymaking and implementation processes. The approach examines the role of clusters in the design of S3 and the regional support schemes for cluster initiatives. It provides insight views on the coordination and

alignment of S3 at the regional and national level. Furthermore, it identifies the current and potential role of clusters in the implementation of S3.

The process of using clusters as tool to implement S3 is a multi-faceted and complex process. However, although regions are very different, it follows the six key dimensions shown in Fig. 1.

Figure 1: Dimensions of policy-making and implementation process in connection with S3



The importance of the regional cluster portfolio and individual clusters already starts during the design phase of S3. Clusters can act as a more efficient tool, if the respective S3 is built upon them and takes the needs and potentials of the cluster actors into account.

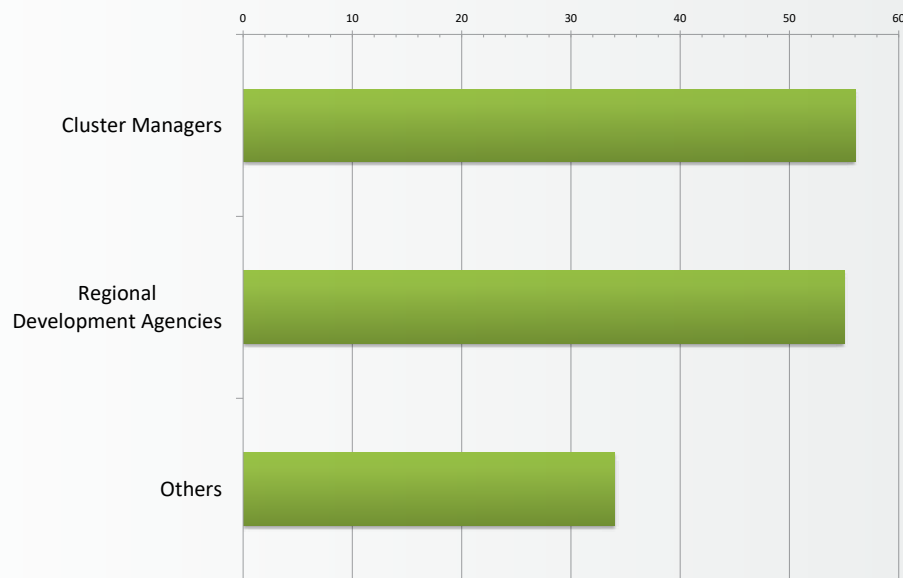
The main challenge then is the implementation of S3, meaning to turn the S3 into a set of policy instruments that helps to meet the desired objectives. Even if the concept of S3 helps to concentrate the resources on selected priority areas, regions often do not have the critical mass or capacity to successfully develop the necessary transformative activities completely on their own.

Thus, aligning S3 related policy instruments with those on national level or with those of the neighbouring regions, enables regions to attract additional funding or other kinds of support. Evaluation and monitoring as tool to do better policies is also an important dimension, thus considered during the StressTesting.

The StressTesting exercises were completed by a group of regional stakeholders from three different levels

- Regional policy makers in charge with the development and implementation of S3
- Cluster managers
- Other stakeholders like representatives from regional development agencies, regional councils or other entities closely involved in the development and implementation of S3.

In total 145 stakeholders from all levels (cluster organisation, stakeholder responsible to implement S3 and policy makers) participated in the online survey (s. Fig. 2), incl. 56 cluster managers. The responses from all DanuBioValNet partners were quite comparable in terms of numbers, whereas there is not regional bias.

Figure 2: Distribution of participants of the StressTest exercises (absolute numbers)

Thus, the data gathered provides a unique source of insight and a “snap-shot” portrait of each region’s

theoretical and practical approach in order to implement S3 through clusters.

III. STRESSTEST FINDINGS

In the following, the main findings of the StressTest exercises, conducted in 7 countries (Bulgaria, Croatia, Czech Republic, Romania, Serbia, Slovakia, Slovenia) and two regions (Baden-Württemberg and Upper Austria) of the DanuBioValNet partners, are presented and discussed. They allow further

insights into the interplay between S3 and cluster initiatives. These findings clearly move beyond the current state of discussion. This chapter is structured according to the dimensions of policy making and implementation as presented in Fig. 1.

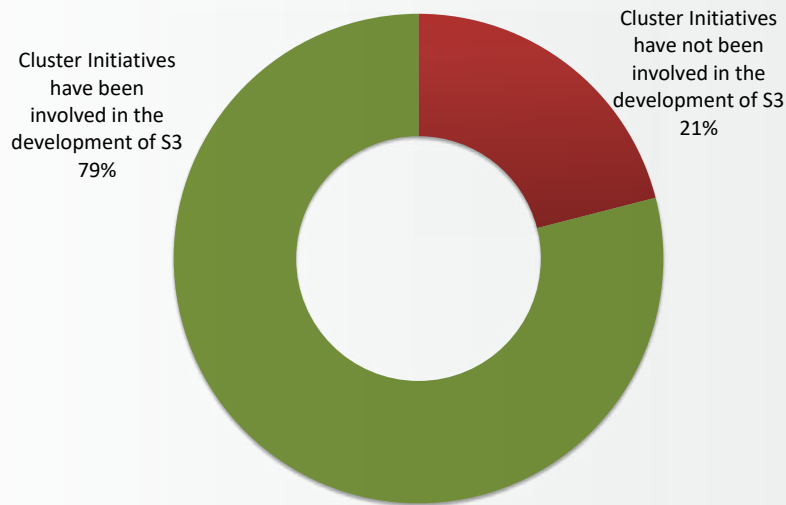
INVOLVEMENT OF CLUSTER INITIATIVES DURING S3 DEVELOPMENT

Cluster initiatives in the Danube region have been involved in the development process of S3, but it strongly varies between the regions.

As far as the Danube region is concerned, the idea of involving cluster initiatives in the development process of S3 seems to be well acknowledged (Fig. 3). However, the intensity of involvement varies significantly. Whereas cluster initiatives from Upper Austria as well as from Slovenia were significantly involved, policy makers from Slovakia

or Bulgaria did not make much use of them. The reasons for this finding are very different. In Upper Austria, cluster initiatives are integrated part of regional and innovation strategy development. In Slovakia and Bulgaria in terms of S3 development, no dedicated cluster policy was in place, whereas it is not surprising that under these circumstances cluster initiatives seemed not to be acknowledge as promising tool. Funding of cluster initiatives is also low in both countries.

Figure 3: Share of cluster initiatives involved in S3 development



Furthermore, the extent to which the cluster initiatives have been involved and how precisely they have contributed to the individual S3 development also varied significantly. As shown in Fig. 4, cluster managements and their cluster participants contributed in very different ways.

Participating in workshops, like Entrepreneurial Discovery Workshops, was the most common kind of involvement. Cluster managers from Austrian regions tend to have a stronger involvement by being members of tasks forces or even partly contributed to the S3 itself.

Figure 4: Kinds of involvement of cluster organisations in the development process of S3



Several answers allowed

COORDINATION AND ALIGNMENT OF S3

Aligning S3 and policy instruments with policies on national or on neighbouring regional level remains a challenge.

S3 is not a closed process, but rather benefits from complementarities with other policies and

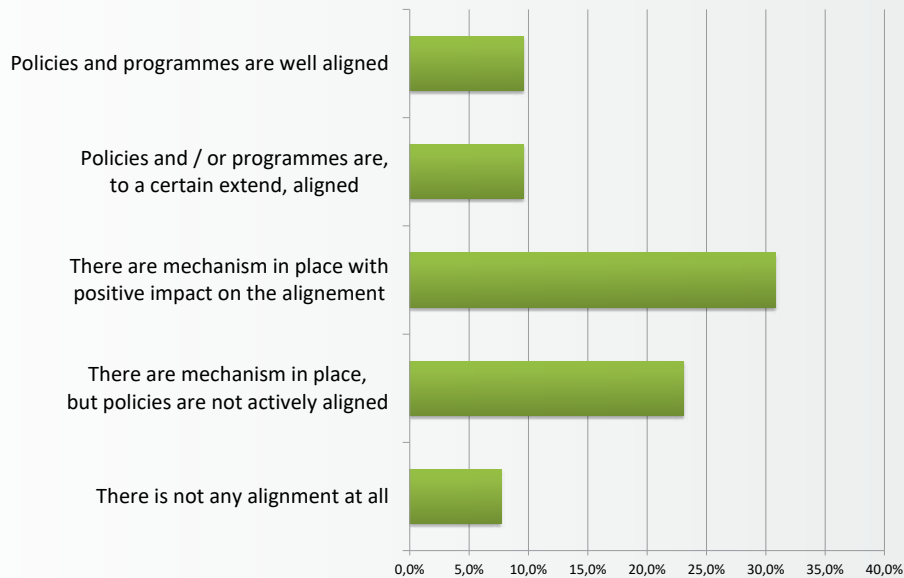
regions. Aligning S3 related policy instruments with those on national level and/or with those of the neighbouring regions enables them to attract additional funding or gain critical mass through inter-regional cooperation. This can significantly

assist regions to meet the objectives defined in their S3 in a faster or more efficient way. Bundling resources also decreases the risk of individual regions.

The reality is different as figures 5 and 6 illustrate. Most regions have some mechanism for information and experience exchange between the

regional as well as federal (national) level in place, which lead to a minimum alignment. It works quite well in Baden-Württemberg and Upper Austria, whereas in other regions any kind of alignment is weak. However, none of the Danube region partner regions confirmed that there is an active alignment on federal and regional level.

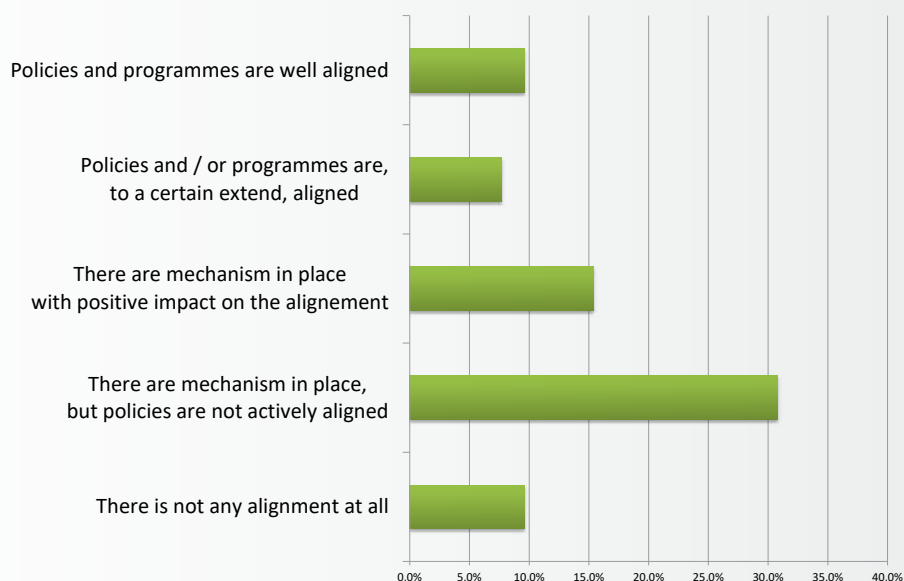
Figure 5: Alignment of partner regions' S3 with policies and programmes on national level



As far as any alignment of S3 and related policies with the neighbouring regions are concerned, the findings are even worse. Any alignment between the partner regions appears to be an exception. On average the related values are much lower

compared to Fig. 5. Especially the bigger Danube regions confirmed that any alignment among regions is more on paper and not really turned into practice.

Figure 6: Alignment of partner regions' S3 with policies of neighbouring regions



IMPLEMENTATION OF S3

There is a significant gap between S3 objectives and financial means of most Danube regions for proper implementation.

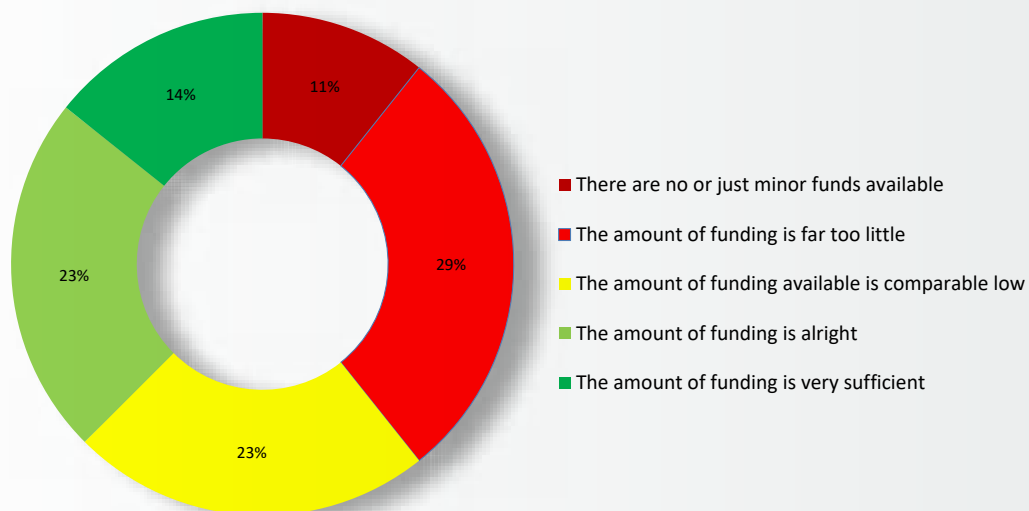
S3 is a comparably new and multi-facetted approach, which shall better prioritise and direct public investment in research, development and innovation, mainly focusing on new transformative activities, also in the field of Bioeconomy. Thus, it is of high relevance for the StressTesting exercises, whether the S3 of the given regions are properly backed-up by sufficient public investments, meaning (e. g. public support schemes). In most Danube countries, ERDF funds, based on the developed S3, are the only or main source of public investments.

The reality, as illustrated in figure 7, looks different. 40 % of the respondents concluded that public investment is by far not sufficiently available / done compared to the targets or objectives of the given S3. Only one third confirmed that public

investments are appropriate to reach the respective goals given in the S3. Most of such responses came from Baden-Württemberg, which is not really surprising against the background that annual public investments in R&D and innovation are about 1.5 billion EUR⁴. A lack of cross-regional alignment and openness for cross-border cooperation makes this situation even more problematic, since no synergies between regions can be initiated to increase critical mass in terms of bundling public investments.

However, this leads to the conclusion that many S3 might be too ambitious compared to the financial means many Danube regions have. It has to be taken into account that Smart Specialisation is a strategic approach to economic development through targeted support for research and innovation. Targeted support presumes sufficient public investment.

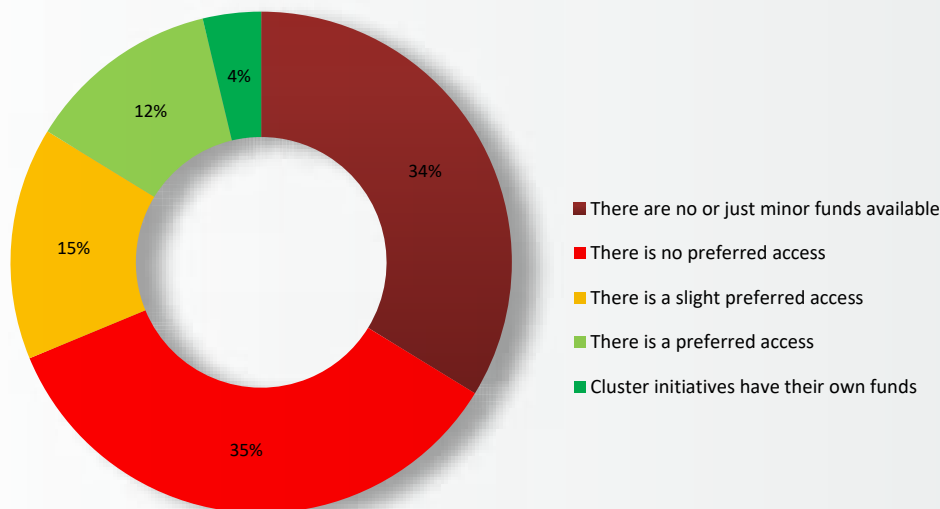
Figure 7: Adequacy of the public investments to implement S3



Cluster participants of the DanuBioValNet partner regions do not have a preferred access to regional funding programmes by design (s. Fig. 8). Just 16 % of the respondents indicated that proposals/applications developed within a cluster initiative have a higher likeliness of obtaining funding. This might be due to several reasons, but very often such proposals/applications are more demand-oriented

and based on industrial need, if cluster organisations were involved during preparation. Another motive might be that the involvement of a cluster organisation as a moderator/coach might result in higher quality as well. This is the case especially for the different Austrian regions, where cluster management is actively involved in supporting cluster participants in development.

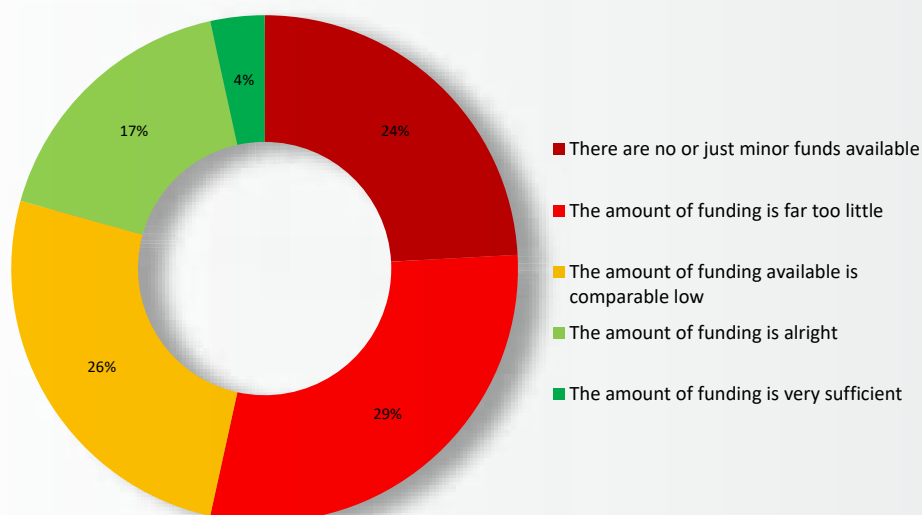
4) Meier zu Köcker, Dermastia, Keller (2017): Strategic Alpine Space Areas for Cross-regional Cooperation, published by S3-4AlpProject, doi: 10.23776/001 , p. 9.

Figure 8: Accessibility of funds by cluster participants

Lack of sustainable funding weakens cluster initiatives as tools to properly implement S3.

The importance of cluster initiatives in the Danube region is high on the policy agenda. They are an acknowledged tool to increase innovation and competitiveness. However, when it comes to reality, the picture appears to be entirely different. These findings raise significant concerns to what extent the cluster approach is fully understood and turned into practice in the Danube region.

Although most partner regions provide funding for cluster organisations, the related budget is very low (about 75 % of all cases) compared to tasks and roles given to cluster initiatives. Whereas positive feedback has been received from cluster managers from Czech Republic, Upper Austria and Baden-Württemberg, most critical feedback was provided from Croatian, Romanian, Serbian and Slovak respondents.

Figure 9: Availability of funding for cluster initiatives

It is well known since a long time that cluster initiatives lacking appropriate financing are not able to deliver proper support services⁵. Cluster initiatives without sustainable financing offer

less services and try to get involved in national or European projects to assure appropriate funding. This observation is well backed by Figure 10, where the sustainability of funding of cluster initiatives is

5) Meier zu Köcker (2009): Clusters in Germany An Empirical Based Insight View on Emergence, Financing, Management and Competitiveness of the Most Innovative Clusters, https://www.researchgate.net/publication/324225788_Clusters_in_Germany_An_Empirical_Based_Insight_View_on_Emergence_Financing_Management_and_Competitiveness_of_the_Most_Innovative_Clusters_in_Germany

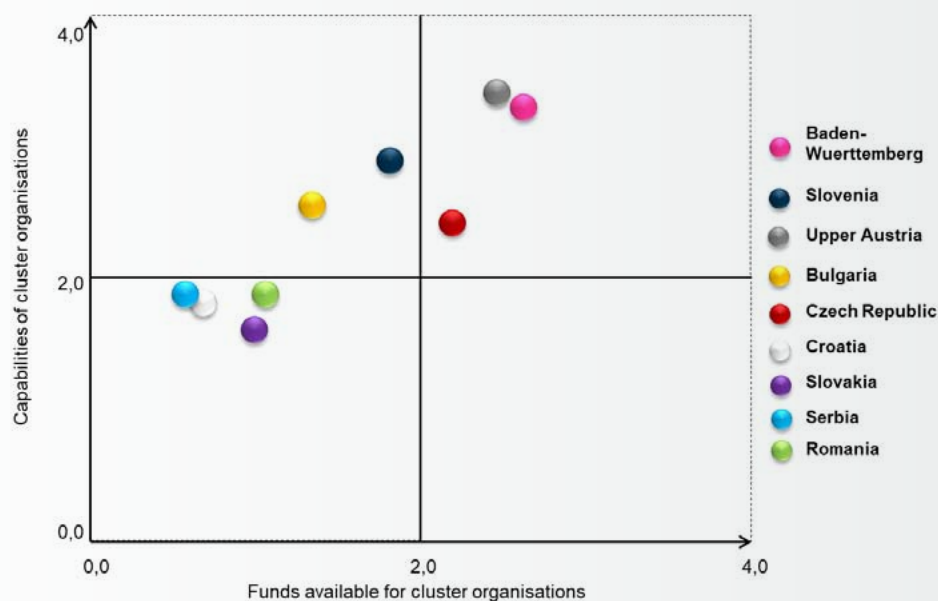
compared to the overall capability of the cluster organisation in the Danube regions. It also becomes clear that the better the financing situation for cluster initiatives is, the higher are their capabilities to deliver services. Cluster initiatives with low capabilities can hardly fulfil their tasks as

tool for regional economic development. As the numbers in comparison in Table 1 illustrate, cluster initiatives on EU-average have more members and capacities within the cluster management than their Danube region peers.

Table 1: Size and financing of cluster initiatives involved in the StressTest

	Cluster organisations from DanuBioValNet Regions	EU-average ⁶
Number of members	64	85
Staff working in cluster organisations (FTE)	2,1	3,6
Share of private financing	38 %	35 %
Share of cluster initiatives with high financial security ⁷	29 %	38 %

Figure 10: Extent funds for cluster organisations available to fulfil their tasks given in S3 against the spectrum related to overall capabilities of the cluster organisation¹⁰



Cluster Initiatives contribute to S3 implementation in very different ways.

The StressTest exercises among the DanuBioValNet regions revealed to what extent and how differently cluster initiatives support regional policy makers in implementing their S3 (Fig. 11). It varies from region to region: Upper Austrian and Slovenian policy makers tend to use cluster managers more intensively and request more strategic-oriented contributions whereas policy makers from other

regions request more reactive support. In most cases, cluster organisations provide expert advice by means of interviews, participating in workshops or contributing to strategy papers. Nonetheless, only a small part of the cluster managers plays a very pro-active role by being involved in strategy or regional decision making boards or is even in charge of implementing a dedicated measure under S3.

6) Based on ESCA database (28 EU member states, Switzerland and Norway), 492 data.

7) Financing assured for at least two years.

8) The indicator "Capabilities of cluster organisations" is a composite indicator, that is calculated based on the number of members, capacities of the cluster management and intensity of services offered.

Figure 11: How cluster initiatives support policy makers in S3 implementation



Feedback from cluster managers and policy makers

The way how cluster organisations cooperate with policy makers can be characterised as mostly top-down (Fig. 12). Although in most cases they are encouraged to contribute proactively, the final decision is still made by policy makers. However,

the fact that in 20 % the respondents replied that there is not cooperation between cluster organisations and policy makers at all, appears quite contradictory to the overall approach of having cluster initiatives are tool for regional development.

Figure 12: How cluster initiatives support policy makers in S3 implementation



Feedback from cluster managers and policy makers

MONITORING AND EVALUATION

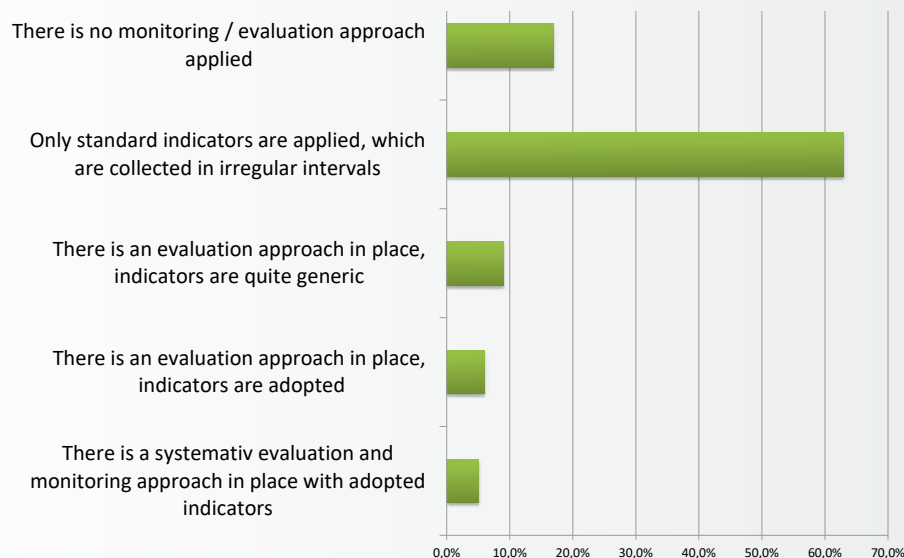
Monitoring and evaluation schemes are not yet adapted to the S3 approach.

Monitoring and evaluation usually help to assure policy objectives and to meet desired goals. Due to the novelty of S3 and the new role cluster initiatives are going to play, existing evaluation designs do not fit properly. In addition, indicators given in connection with the ERDF cannot be considered to adequately measure the contribution of S3 or involved cluster initiatives. Given the case that cluster-based approaches are adopted to implement S3, applying a tailored monitoring and evaluation system becomes mandatory⁹. Furthermore, there is a dedicated trend from the traditional ex-post evaluation towards a formative

evaluation and monitoring in order to enable a learning and improvement process during the S3 implementation.

Fig. 13 illustrates the state of the art in the DanuBioValNet partner regions. Evaluation is done in almost all regions where collecting standard indicators at irregular intervals is the prevailing approach. A systematic monitoring and evaluation approach is only given in very exceptional cases. In these cases, the entire approaches as well as the indicators are commonly agreed on between cluster organisations and policy makers. Regions like Upper Austria already have very appropriate approaches in place.

Figure 13: Monitoring and evaluation approaches applied



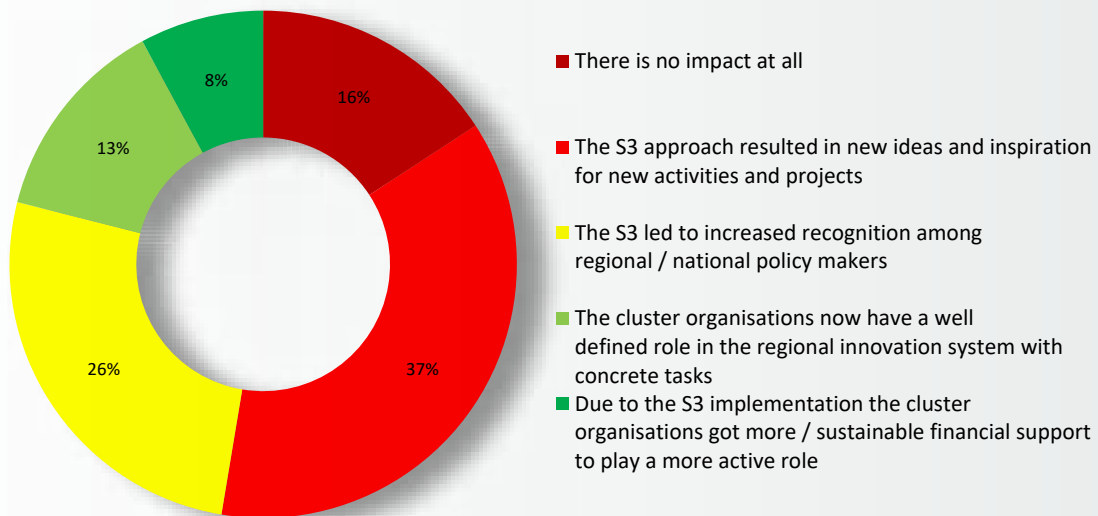
IMPACT OF S3 ON CLUSTER ORGANISATIONS

The Impact of S3 on operations of cluster organisations is still very low.

Utilising a cluster-based approach to implement S3 assigns cluster initiatives a new role, which they often did not have in the past. It shifts the attention from a “cluster as innovation driver” towards a tool of regional development. Thus, it is interesting to see how this paradigm changes the impact on the day-to-day operation of cluster organisations. Fig. 14 illustrates striking findings, which warrant a more detailed discussion. The fact that cluster organisations in the Danube region report only

of low improvements regarding the financial and overall framework conditions as results of the implementation of S3 raises significant concerns and has to be understood as contradictory to what was originally intended. Lack of funding of cluster initiatives in the Danube region is basically a surprise since most S3 made clear reference to the cluster approach and highlighted the importance of cluster initiatives. Thus, the individual S3 of the Danube regional partners could have devoted sufficient funding for cluster initiatives. However, the reality looks different in many regards.

⁹ Kind, Meier zu Köcker (2014): Evaluation of Clusters, Networks and Cluster Policies – Challenges and Implementation, iit working paper. <http://www.iit-berlin.de/de/publikationen/iit-perspektive-14>.

Figure 14: Impact of S3 on cluster organisations

IV. CONCLUDING OBSERVATIONS

The StressTest exercises conducted with the 9 project partner regions from the Danube region confirmed the relevance of cluster-based development and implementation of S3. This report contributes to an increased understanding of the interplay between S3 and clusters. It provides valuable insights on how regions make use of clusters. The DanuBioValNet regions applied different approaches on how to develop and implement their S3. Furthermore, a kind and extent of using cluster initiatives vary in this regard. There is no “golden standard” because regions are individual. It has to be acknowledged that they need sufficient flexibility in order to consider S3 as a strategic approach to economic development and not just as an ex-ante conditionality to receive the ERDF.¹⁰ The findings provided good evidence that a cluster-based approach to develop and implement S3 can offer added value for the Danube regions. This goes hand in hand with an increasing shift of cluster policy towards cluster-based regional development policy, due to the fact that the interplay between cluster initiatives and S3 matters.

The key observations are

1) *Cluster initiatives in the Danube region have been involved in the development process of S3, but it strongly varies between the regions*

The report, for the first time, was able to validate that cluster initiatives have been actively used for the development and implementation of S3. Intensity and kind of involvement of cluster initiatives varies significantly between regions, depending on the capacities and professionalization of the cluster managements as well as of the regional policy approaches applied.

2) *Aligning S3 and related policy instruments with policies on national or on neighbouring regional level remains a challenge*

When having a deeper look at the content of the individual S3 of the Danube regions, it became clear that they, in most cases, are not aligned, neither with related policies and programmes on national level nor with neighbouring regions. The latter hampers need-based cross-regional cooperation needed to gain critical mass to jointly tackle macro-regional challenges. However, this observation is also applicable for other macro-regions, like the Alpine Region.

3) *Cluster Initiatives contribute to S3 implementation in very different ways*

There is good evidence that cluster initiatives have contributed to the implementation of individual S3. Similar to the development phase, the involvement of the cluster initiatives was different. In some cases they just contributed by providing content, in other cases they were in an exposed position and significantly contributed to the implementation of S3. In these cases, they were considered as “peer partners” for policy implementation. However, such cases are the exception.

4) *There is a significant gap between S3 objectives and financial means of most Danube regions for proper implementation*

The S3 of the Danube Partner Regions are all aiming to improve regional competitiveness, innovation capability of SME and contribute to job creation. Although the StressTest exercises did not aim to evaluate the S3 of the Danube

¹⁰ Meier zu Köcker, Dermastia (2017): StressTesting Regional Approaches Conducive to Implement S3 through Cluster – Synthesis Report for the Alpine Space Region, published by S3-4AlpProject, doi:10.23776/001.

regions as such, it becomes obvious that the theory (described in the S3 documents) and the reality (how S3 is implemented) differ. Most respondents from all levels (policy, intermediaries, cluster managers etc.) confessed that the financial means and public funds dedicated to meet the objectives given in the S3 are too low. Thus there is a clear gap between policy ambitions and reality.

This observation raises some concerns about the effectiveness of how the S3 approach is implemented in many Danube regions. According to Tea Petrin et al¹¹ *“strong regions and strong clusters can be characterised by having most **conducive framework** conditions for R&D and innovation [...] and the development of unique productive capabilities is a **strategic management priority**. Therefore, networking among companies in clusters resulted in unique knowledge creation; in addition, effective business and services infrastructure, able to meet the demands from companies that compete globally is also present as well as an effective education and R&D infrastructure which provide both labour and skills formation demanded by high tech companies. In these regions **governments continuously fund R&D and innovation [...] financing innovative projects**. There is both abundant entrepreneurial and management talent and access to capital contributed to the clusters’ success.”* With other words, significant public investments in clusters and cluster initiatives are characteristic for strong regions and clusters.

- 5) *Lack of sustainable financing weakens cluster initiatives as tools to properly implement S3*
Although cluster initiatives in the Danube region are high on the policy agenda and considered as tool to implement S3, the readiness on

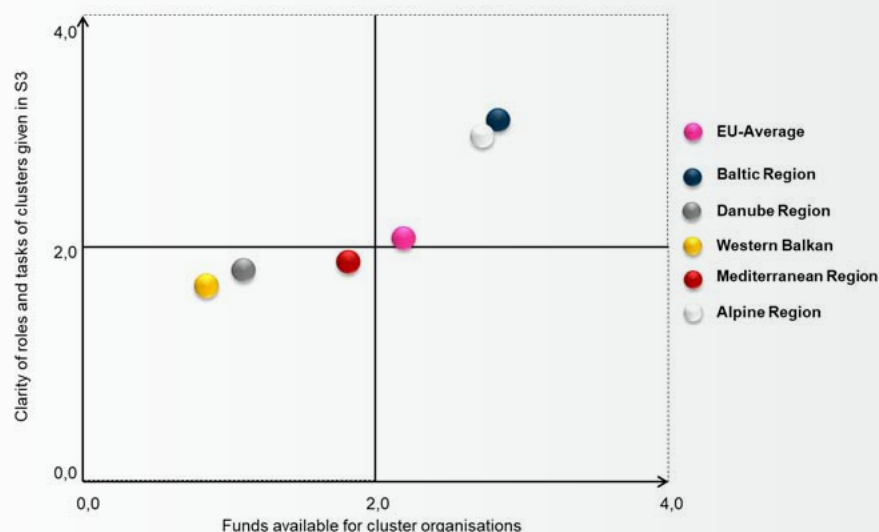
policy level to co-finance them is comparable low. Weak or unstable public support schemes (and entire cluster policies) hamper the development and capabilities of cluster initiatives to deliver requested services for public and private sector. As a consequence, cluster initiatives in the Danube region tend to be smaller in terms of cluster actors, in terms of full-time equivalent of the cluster management as well as in terms of overall capabilities.

These findings raise concerns to what extent the cluster approach is fully understood and seriously turned into practice in the Danube region, since 75 % of the cluster initiatives are under-funded and lacking financial stability. Additional interviews with cluster managers confirmed that due to this situation too much attention is given to assure financial stability in day-to-day business and European projects are more considered as a very welcome financial source and less as a support scheme to internationalise. Involvement in such projects contributes to a better financial situation, but binds personal capacities of the cluster management, which then cannot be used to deliver services for the cluster participants.

As far as the S3 implementation approach through cluster initiatives is concerned the Danube region, in this regard, is clearly lacking behind other macro regions.

Figure 15 compares the funding situation of cluster initiatives as well as role of them given in S3 between different macro regions. The commitment, incl. funding, that cluster initiatives are important tool for regional development, including S3 development and implementation is much higher in the Baltic as well as in the Alpine Region compared to the Danube region.

Figure 15: Clarity of tasks of cluster initiatives given in S3 vs. the amount of funding available for cluster initiatives



11) Petrin, Bruskova, Bialic-Davendra (2014): Cluster development in the Czech Republic and Slovenia - 1st ed. - Ljubljana: Faculty of Economics, ISBN 978-961-240-281-5.

6) *Monitoring and evaluation schemes are not yet adapted to the S3 approach*

Most Danube regions apply monitoring and evaluation on a regular basis. However, the majority still applies traditional approaches with traditional indicators. These approaches are hardly able to really capture specific information to what extent the S3 approach, implemented by cluster initiatives, really worked.

Future discussions shall focus especially around the question, how Danube regions really intend to make use of cluster initiatives as a tool for regional development, incl. S3 implementation, as well as to shift the cluster and regional development policies more towards a systematic approach.

V. INTRODUCTION OF THE DANUBIOVALNET PROJECT

The DanuBioValNet project is aiming at establishing bio-based industry networks across the Danube region. The emerging transnational cooperation of clusters will foster bioeconomy and innovations and lead to a strengthening of the regional economies.

Consequently, with this project the partners pursue a strong strategic orientation beyond the immediate and medium-term economic objective of strengthening the regional economy. It is the strategic goal to establish cross-border strategic partnerships, particularly in developing regions, with the help of powerful cluster organisations. In this way, project results will be sustained beyond an immediate effect and the creation of strategic investments, especially in emerging industries such as the bio-industry, will be enabled and facilitated. This will be achieved mainly by newly emerging or transforming value-added chains, which are increasingly being transnationally established and further developed as a result of the increasing internationalisation of value-added processes.

In this way, long-term economic effects are achieved, based on a network of agile clusters, which prepare the investment approaches in a targeted manner and implement them with high efficiency. One example of the present project is the establishment of bio-refineries in the regions, which can form a strategic technological backbone of a successful independent bio-industry.

The partners intend to develop and implement a long-term, industry-driven roadmap for such collaboration along the entire value chain based on cluster partnerships for these processes. With the project, a pilot function of the implementation is taken over and the prerequisite for creating a blueprint for similar and similar cross-national cooperation, also in other industries, is created.

For achieving these tasks, 17 project partners from 10 countries have joined forces. The project will pave the way from an economy based on fossil

resources towards an economy using renewable resources. The striving of the partners to minimise greenhouse gases and resource-saving as well as resource-efficient utilisation of available biomass will result in synergistic effects. These effects will improve the sustainability, regional development through diversification of the local economy and will also positively affect the workforce. The development of new bio-based value chains from primary production to consumer markets needs to be done by connecting enterprises from different regions and industries. But due to a missing holistic transnational approach, Danube actors in bio-based industry still operate disconnected and cannot properly benefit from the potential. Therefore, the aim of this project is to develop new methods, strategies and tools to connect enterprises transnationally.

Clusters as the strong representatives of a group of industries that are closely linked by common products, markets, technologies and interests are chosen to organise and bear the industry cooperation and creation of new value chains, because they are performant and sustainable partners and guarantee the upgradeability in the dimension industry, sciences and also politics.

One of the planned outputs of this project will be the development of a Joint Bio-based Industry Cluster Policy Strategy (JBICS) to describe the procedure and to make it actionable and reusable. Furthermore, a bundle of new methods and tools to support clusters for transnational working will be developed and joined into a strategy. They will be tested in three pilot actions where it is planned to create new bio-based value chains in the Danube region.

The main target groups are on the one hand the policy – four Ministries are involved –, on the other hand clusters and their SMEs – nine cluster organisations are involved. The policy level will benefit from the JBICS, which can be used as a political framework.

The following partners commit to the implementation of the cluster partnership and transnational cooperation:

Role	Official Name in English	Acronym	Country
LP	BIOPRO Baden-Württemberg GmbH	BIOPRO	Germany
ERDF PP1	ClusterAgentur Baden-Württemberg	CABW	Germany
ERDF PP2	Anteja ECG	ANT	Slovenia
ERDF PP3	PROUNION	PU	Slovakia
ERDF PP4	Romanian Cluster Association	CLUSTERO	Romania
ERDF PP5	Association of Business Clusters	ABC	Bulgaria
ERDF PP6	National Cluster Association – CZ	NCA	Czech Republic
ERDF PP7	Business Upper Austria – OÖ Wirtschaftsagentur GmbH - Upper Austrian Food Cluster	UAFC	Austria
ERDF PP8	Ministry of Economy	ME	Romania
ERDF PP9	Ministry of Economy, Entrepreneurship and Crafts	MEEC	Croatia
ERDF PP10	Ministry of Education, Science and Sport	MIZS	Slovenia
ERDF PP11	Croatian Wood Cluster	CWC	Croatia
ERDF PP12	Institute for Economic Forecasting	IPE	Romania
ERDF PP13	Business Upper Austria – OÖ Wirtschaftsagentur GmbH – Cleantech-Cluster	BizUp	Austria
IPA PP1	Innovation Center of Faculty of Mechanical Engineering	ICME	Serbia
ASP1	Montenegro Vine Cluster	MVC	Montenegro
ASP2	Ministry of Economic Affairs, Labour and Housing Baden-Württemberg	WM	Germany

LP = Lead Partner, PP = Project Partner, IPA = Instrument for Pre-Accession, ASP = Associated Strategic Partner, ERDF = European Regional Development Fund