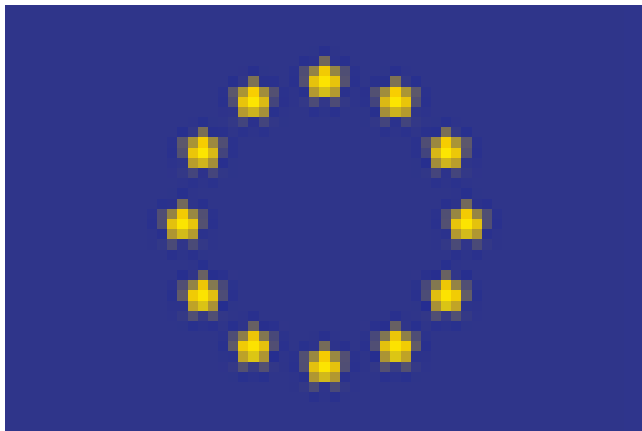


# 1. Introduction to the FP7 project BERST (BioEconomy Regional Strategy Toolkit)

Author: Myrna van Leeuwen, coordinator BERST team



## Background

Current EU development strategies, such as the Europa 2020 strategy, the Bioeconomy Strategy for Europe and the Research and Innovation Strategies for Smart Specialisation (RIS3) include many incentives for regions to develop a bioeconomy cluster.

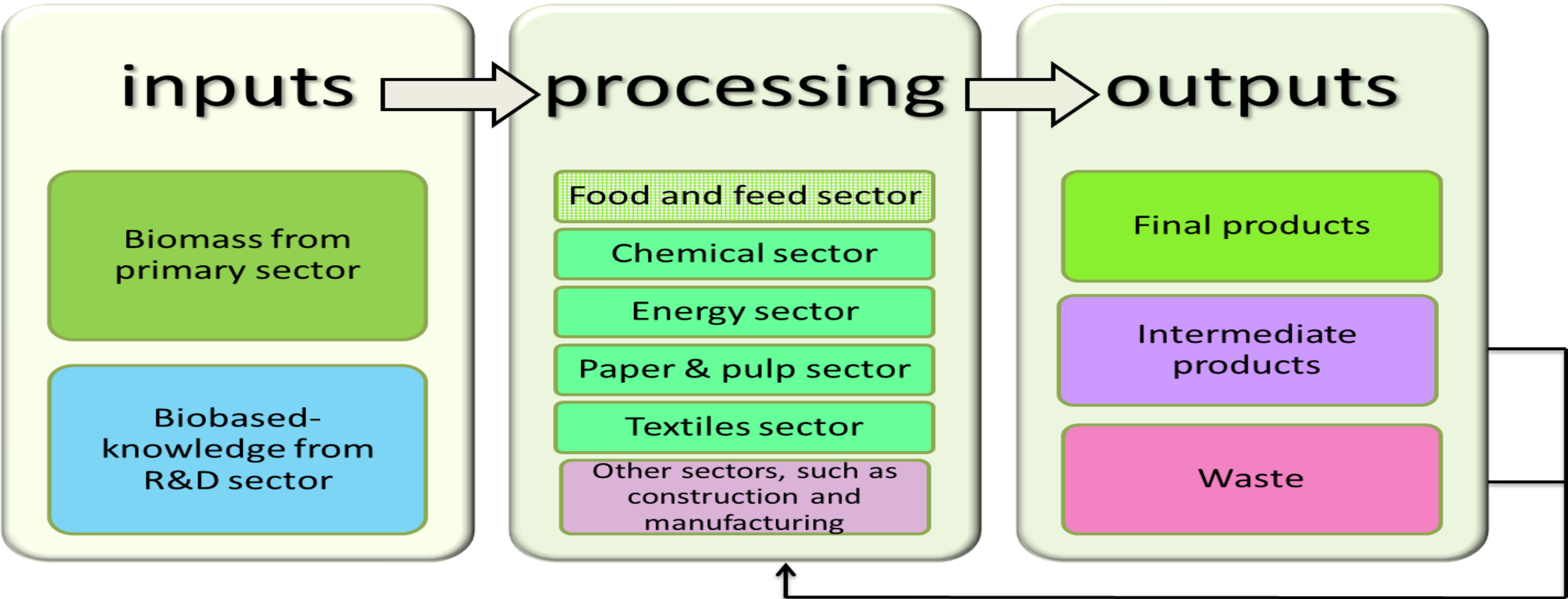
## Aim of the project ([www.BERST.eu](http://www.BERST.eu))

- BERST aims to explore the bioeconomy potential of EU regions by focussing on the following questions:
- What is the current bioeconomy potential of EU regions?
  - What is the future bioeconomy potential of EU regions?
  - How to close the gap between current and future bioeconomy potential of EU regions?
  - How to develop smart strategies for regional bioeconomies in the EU?

## Basic assumptions in BERST

- Actors pursue a strategy to develop the bioeconomy by transforming biomass into competitive bioeconomy products;
- Regional bioeconomy activities usually take place in the context of a bioeconomy cluster, which originates from the cooperation of regional actors;
- In the bioeconomy cluster firms are tied to other firms through:
  - formal linkages, i.e. the input-output linkages; and
  - untraded interdependencies, like norms, trust and a strong local network of private and public institutions.

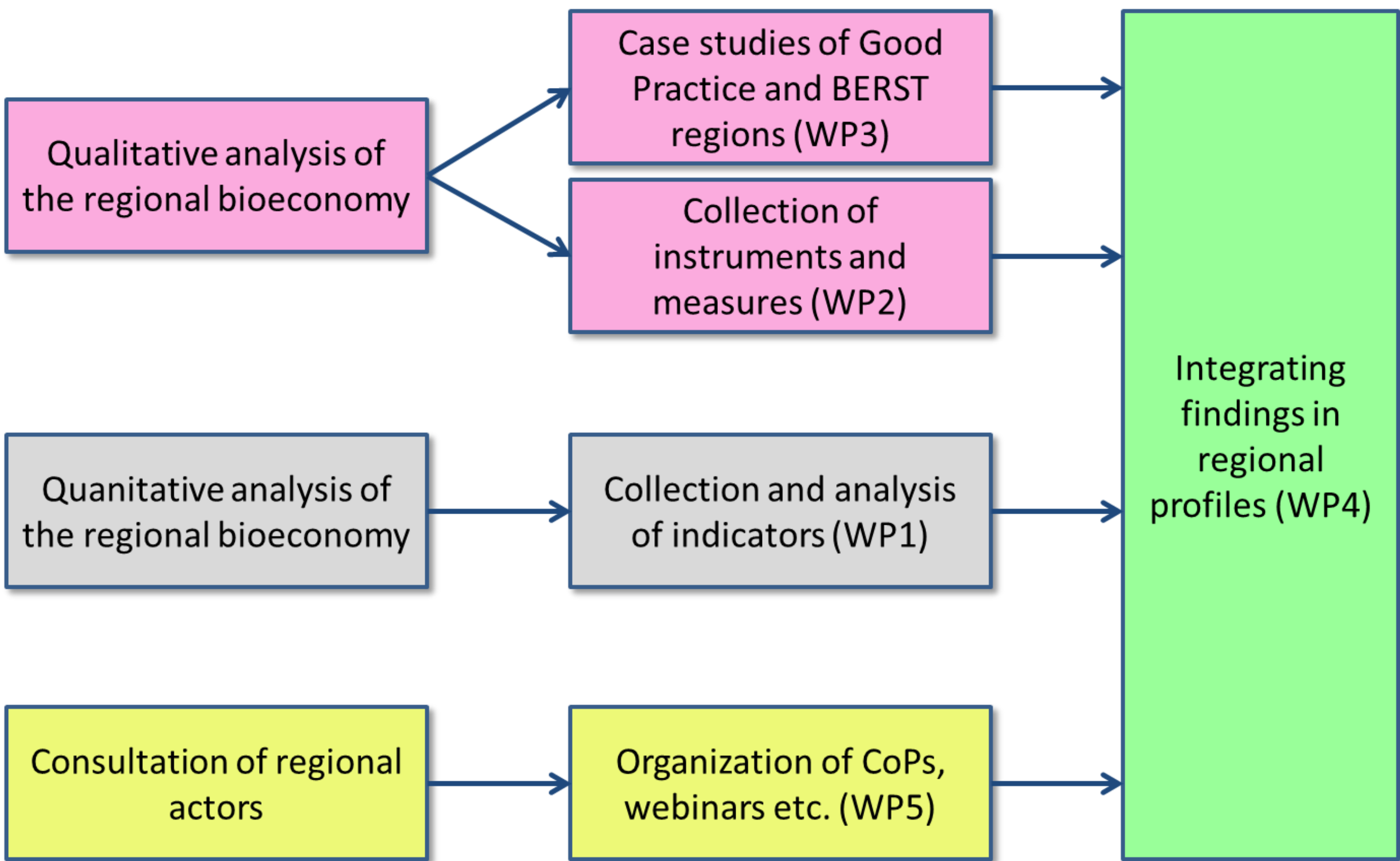
## Formal linkages among economic sectors in the bioeconomy in BERST



## The BERST team

No	Research partners	Regional partners
1	Wageningen UR (coordinator)	BioCampus Straubing GmbH
2	Cambridge Econometrics Limited	Biobased Delta
3	Imperial College of Science, Technology and Medicine	Asociación Madrid Plataforma de la Biotecnología
4	Flemish Institute for Technological Research	Fundación Parque Científico de Madrid
5	Centre for Research and Technology Hellas	Region of Western Macedonia
6	University of Ljubljana	Municipality of Westland, Zuid-Holland
7	JAMK University of Allied Sciences	Keski -Suomen litto
8	Fachagentur Nachwachsende Rohstoffe e.V.	

## BERST approach of the analysis of bioeconomy clusters



## New biobased economic sectors:

- Chemical sector
- Energy sector
- Paper & pulp sector
- Textiles sector



Name: LEI Wageningen UR  
P.O. Box 29703, 2502 LS The Hague  
Contact: myrna.vanleeuwen@wur.nl  
T + 31 (0)70 33 58 141  
[www.wageningenUR.nl](http://www.wageningenUR.nl)

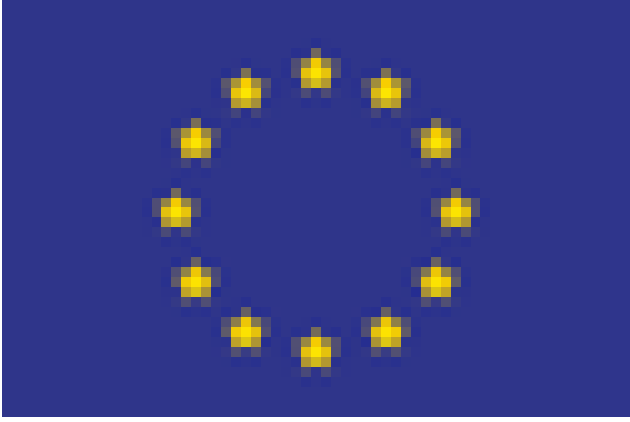


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# 2. Exploring the development path of bioeconomy clusters (WP3)

Authors: Calliope Panoutsou, Gareth Brown and Ida Terluin



### Objectives

- To explore the development path of the bioeconomy cluster in Good Practice regions;
- To identify enabling factors and lessons for the bioeconomy cluster from the Good Practices;
- To explore the development path of the bioeconomy cluster in BERST regions and to identify barriers.

### Methodological approach

In the analysis of the development path of a bioeconomy cluster, we assume that the actors of the region, in which the cluster is located, apply a strategy to develop the bioeconomy by transforming biomass into competitive bioeconomy products. Such a transformation process takes time. Hence, our analysis is guided by two starting points:

- (a) a focus on five key assets of a bioeconomy cluster (Fig. 1);
- (b) a long run time horizon of a bioeconomy cluster, in which we distinguish three phases (Fig. 2).

By means of case study analysis in regions with a well-developed bioeconomy cluster (the so-called Good Practices) and regions with a less mature bioeconomy cluster (the so-called BERST regions) we identified a number of enabling factors and barriers for the development of bioeconomy clusters (Table 1).

Good Practices in BERST	BERST regions
Ghent (Belgium)	Central Finland (Finland)
North Rhine Westfalia (Germany)	Straubing (Germany)
Toulouse (France)	Biobase Westland (Netherlands)
Manchester (UK)	Biobased Delta (Netherlands)
	Madrid region (Spain)
	Western Macedonia (Greece)
	Slovenia

Table 1 Overview of studied bioeconomy clusters

### Results ([www.BERST.eu](http://www.BERST.eu))

#### Key findings from the Good Practices

From the analysis of the development path of the bioeconomy clusters in the Good Practices, a number of key findings emerged that can be considered as enabling factors for bioeconomy clusters:

- active actors organize the cluster as a bottom-up process and keep it moving by intensive networking;
- the presence of a cluster board that takes care of the organization of the cluster and communication;
- the cluster makes use of the strong points of the region;
- the cluster starts with activities in one economic sector;
- first, the cluster is mainly supported by public funds; later private funds become also available;
- biomass resources may originate from both local and external supply.

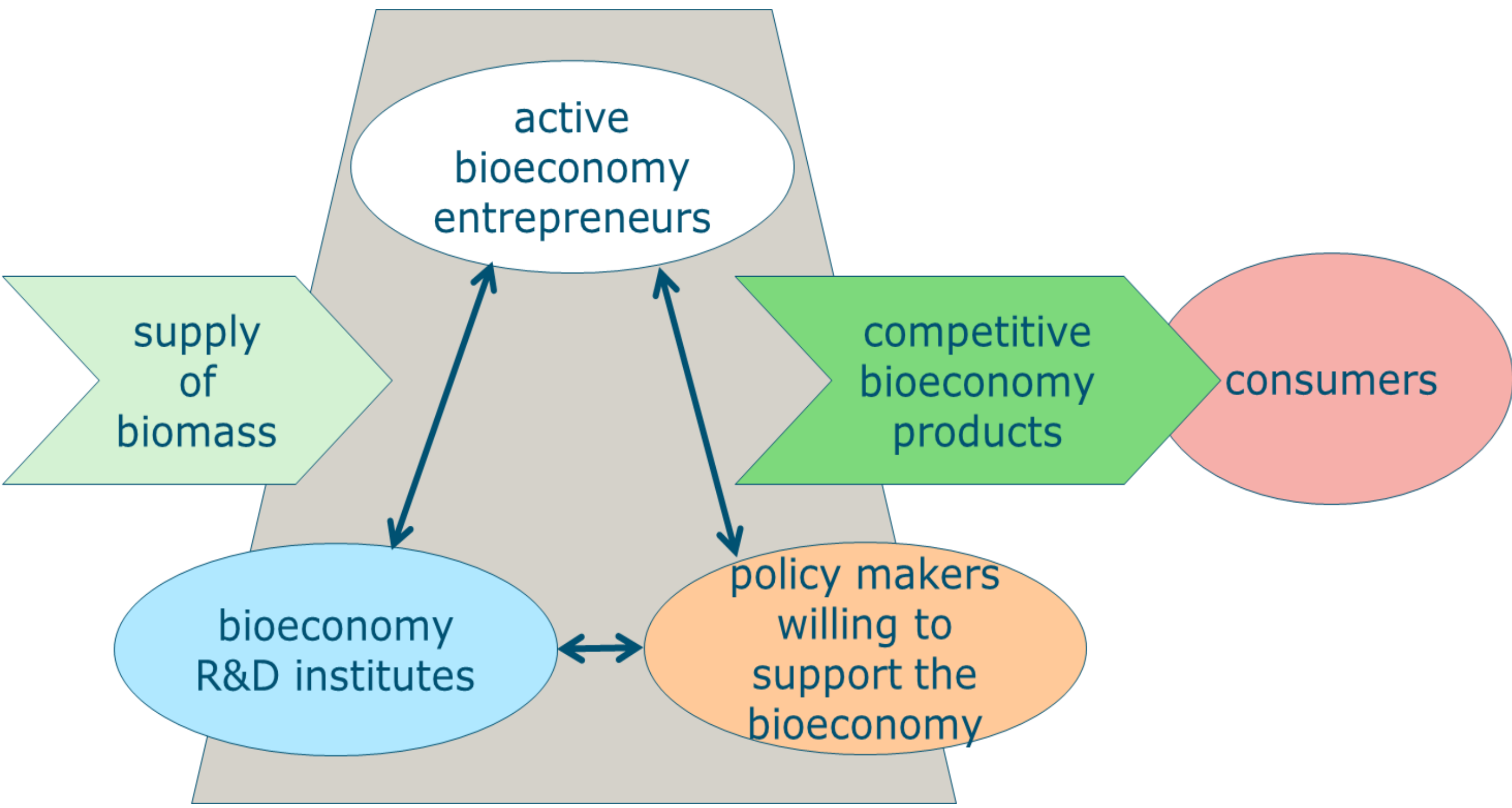


Figure 1 Conceptual model for the analysis of the strategy of a bioeconomy cluster

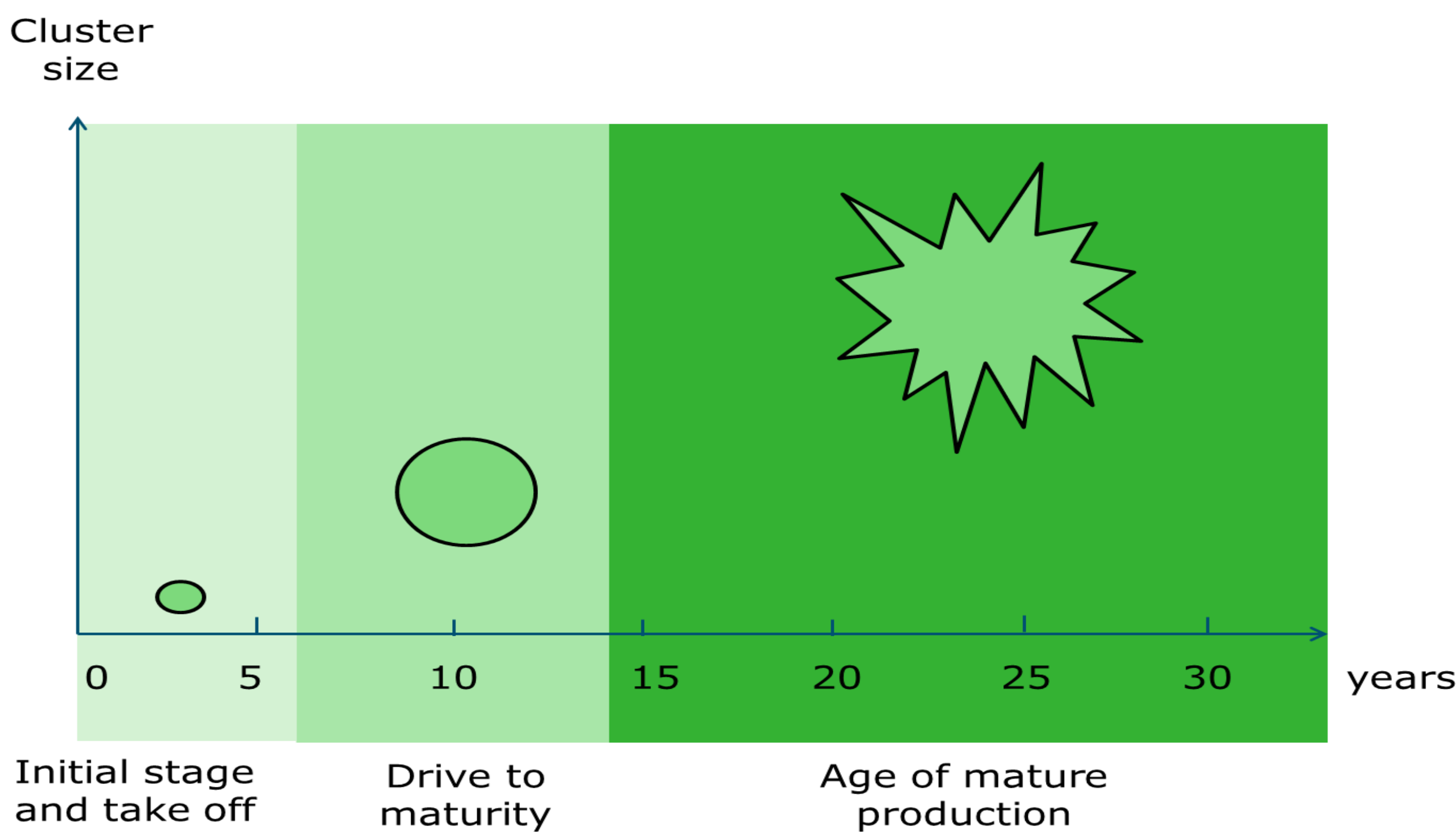


Figure 2 The development path of a bioeconomy cluster

### Barriers in developing bioeconomy clusters in the BERST regions

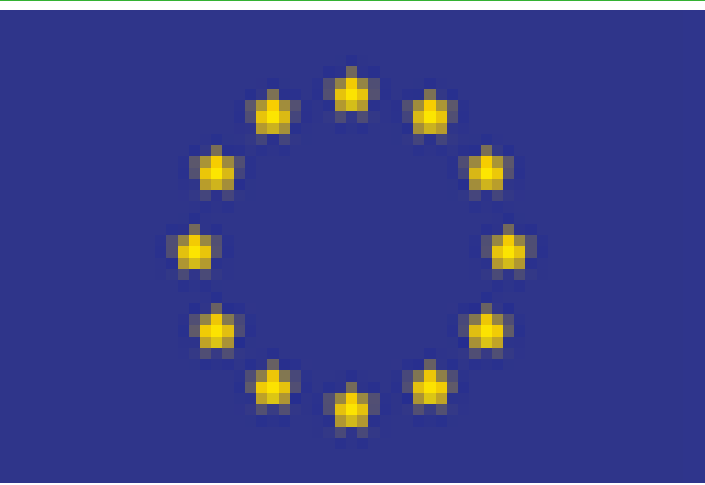
The BERST regions show a wide variety of cluster experiences, varying from the bioeconomy cluster in Central Finland that could be considered as a Good Practice to the collapse of the bioeconomy cluster PoliMat in Slovenia. Barriers faced in the bioeconomy clusters in the BERST regions include:

- lack of active participation of entrepreneurs in the cluster;
- lack of an innovation culture among entrepreneurs;
- lack of cooperation and trust among firms and R&D institutes;
- bioeconomy clusters that are set up as a politically-led top-down initiative in an environment of entrepreneurs and R&D institutes which are not convinced of its usefulness and who show a low sense of ownership of the cluster;
- difficulties in biomass supply, such as varying quality, fluctuations in the supply, the collection of the supply from a large number of suppliers, and competition with other users of biomass resources.



# 4. Identifying criteria and indicators describing the regional bioeconomy (WP1)

Authors: Jon Stenning and Ben Gardiner



## Objectives

- To identify the factors that contribute to the development of bioeconomy within a region;
- To build a data-based framework for assessing the bioeconomy *potential* and *performance*.

## Methodological approach

- Based on a review of existing literature and the views of regional and research partners, we have identified a list of criteria important for the development of regional bioeconomy;
- For capturing the state of these criteria, we have identified and collected quantitative indicators, specific to each subsector of the bioeconomy;
- By using these indicators we have constructed an 'at a glance' analysis of the state of the criteria in a given region and subsector.

## Results

### Bioeconomy structure

We identified 8 key subsectors of the bioeconomy; relevant criteria for each sector were then identified and used as the basis for the charts.

	Bioeconomy sector	Example region
1	Primary biomass sectors	Biobase Westland
2	Food & feed processing	Straubing
3	Construction	Biobased Delta
4	Chemical and polymers, biorefinery & co-digesting	North Rhine Westfalia
5	Pulp & paper	Central Finland
6	Textiles & clothing	Ghent
7	Energy	Central Finland
8	Biotechnology	Toulouse

Table 1. The key subsectors of bioeconomy

## Results (online <http://berst.databank.nl>)

### Employment and firm structure of regional bioeconomy

Evaluate the current industry mix through shares of total employment compared to national average. This will tell us what proportion of all jobs are in a certain bioeconomy subsector and how this differs from the national employment structure: 'what is the region's specialisation'?

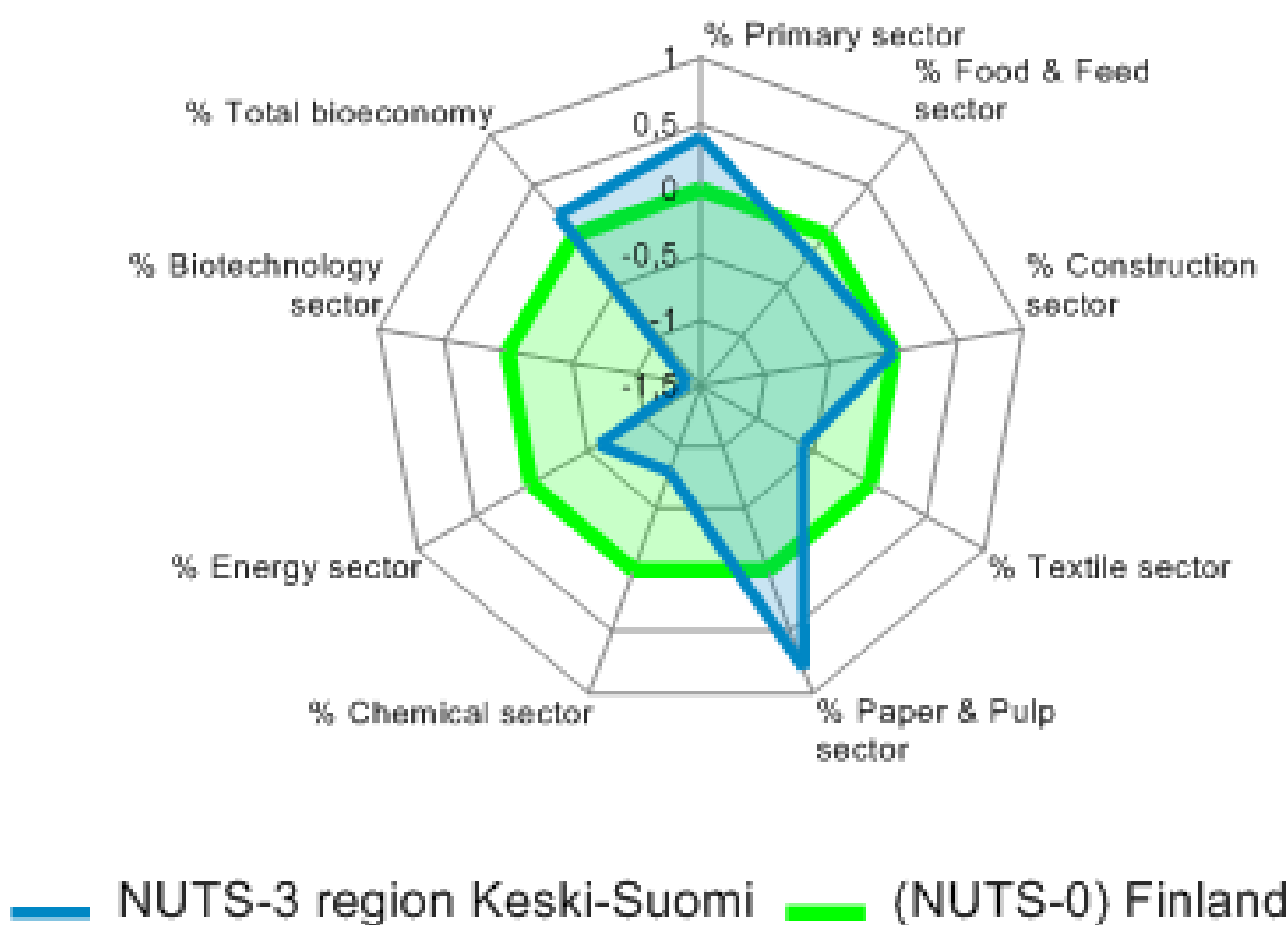


Figure 1. Employment structure in Central Finland in 2013 compared to Finland

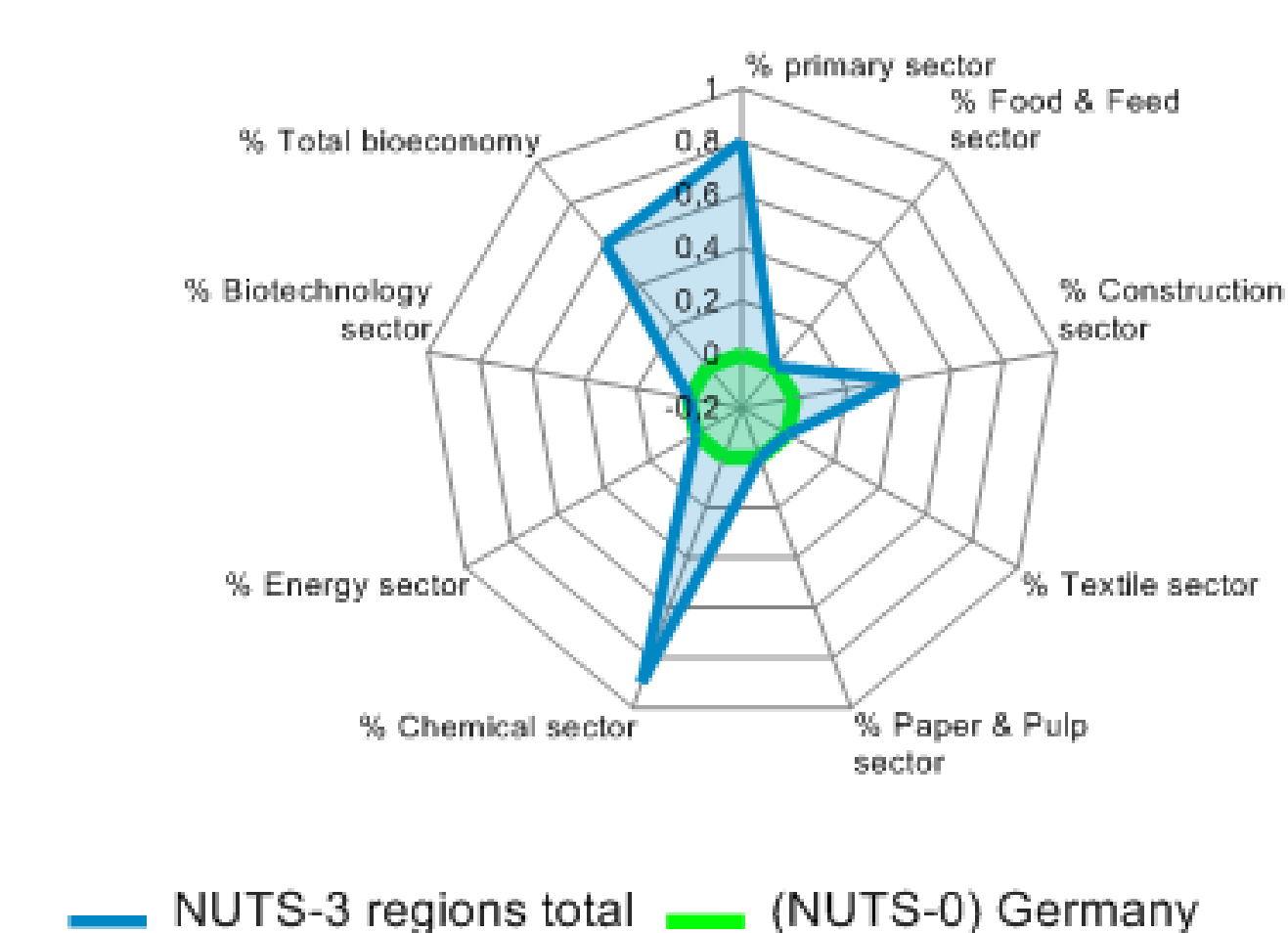


Figure 2. Firm structure in Straubing in 2013 compared to Germany

## Results

### Structure of regional bioeconomy

Readiness assessments use available data to provide an overview of the strength of a region for developing certain types of bioeconomy. They measure performance across a number of relevant indicators, with performance scored relative to the national average.



Figure 3. Bioeconomy readiness for Central Finland in 2013 compared to Finland

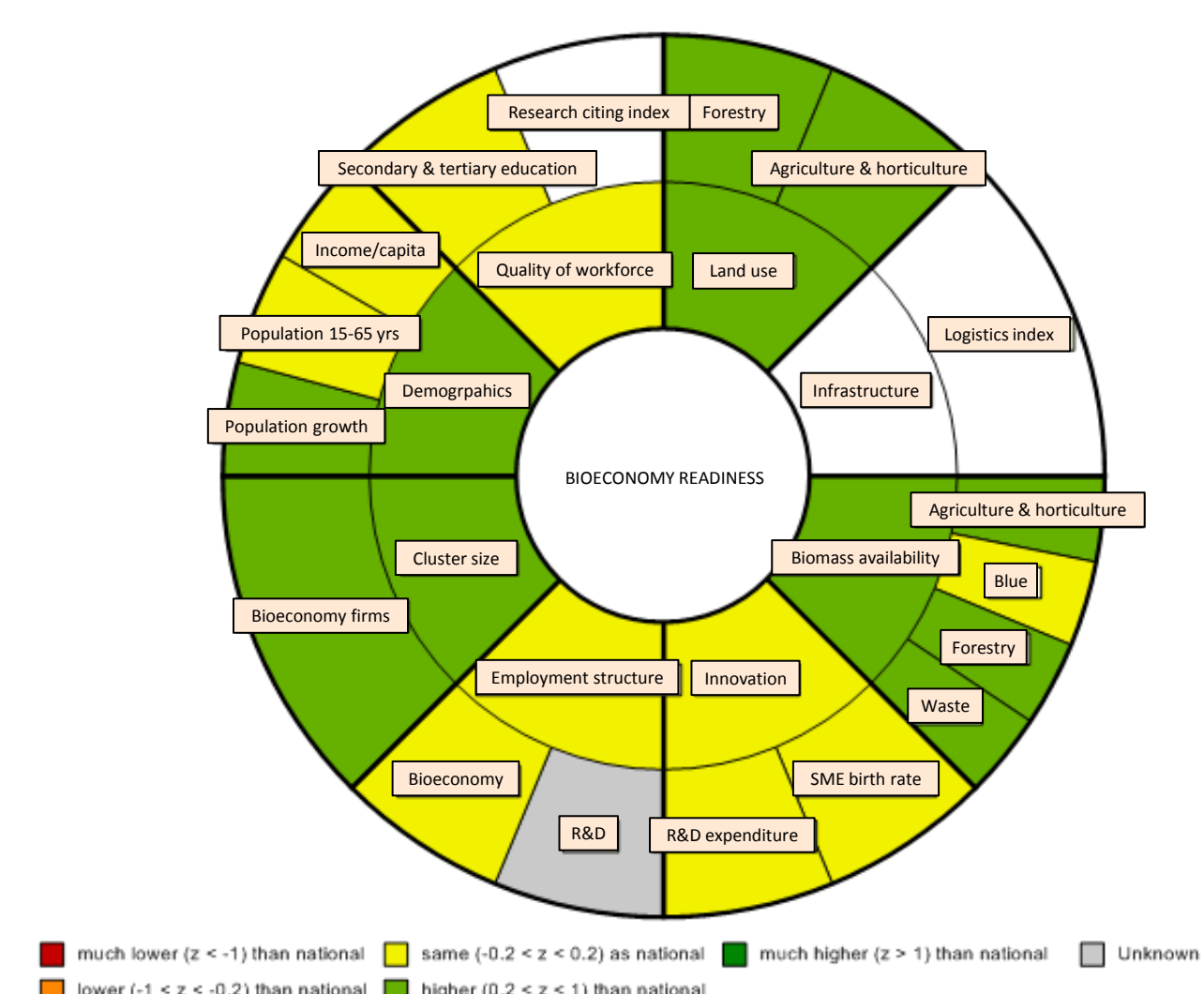


Figure 4. Bioeconomy readiness for Straubing in 2013 compared to Germany

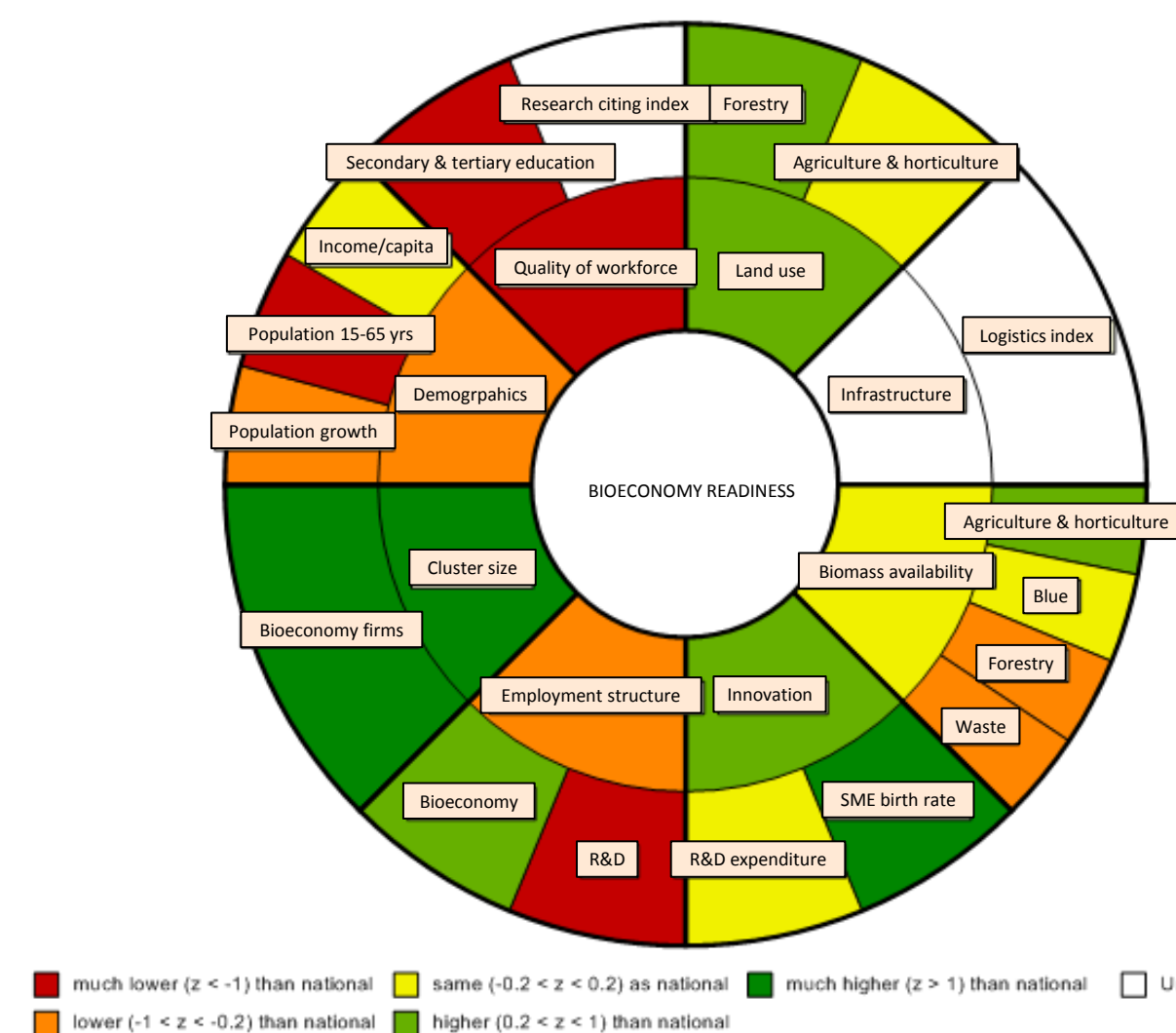


Figure 5. Bioeconomy readiness for Western Macedonia in 2013 compared to Greece

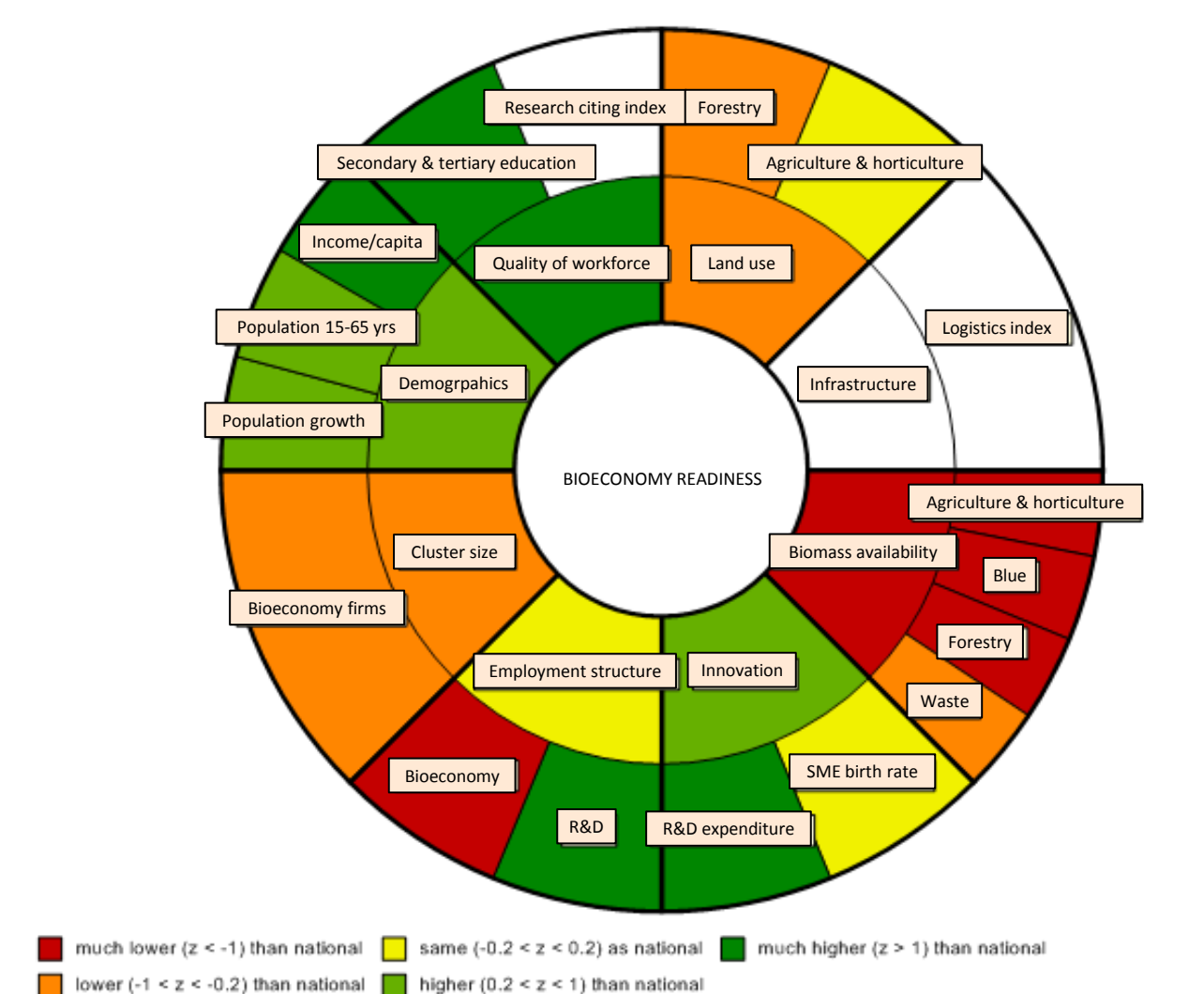


Figure 6. Bioeconomy readiness for Madrid 2013 compared to Spain

## Key outcomes

- Identification of key criteria for development of regional bioeconomy across eight subsectors;
- Design of a framework for analysis; particularly, posing questions about policy; where has it successfully been used to reinforce strengths or address weaknesses, and where can it be applied?
- BUT Readiness charts do not present a 'definitive answer'.

## Issues encountered

- Data availability and collection was the most substantial challenge: not all data that we would like to use actually exists, and relatively little exists on a comparable basis across EU regions and EU Member States;
- We identified the best available indicators for capturing the important criteria for development, but in some cases these indicators failed to truly measure the underlying criteria; as a result some poor scores don't reflect the reality on the ground in the region.



Name: Cambridge Econometrics  
Reuben House, Covent Garden, Cambridge  
Contact: [js@camecon.com](mailto:js@camecon.com)  
T + 44 (0)1223 533130  
[www.camecon.com](http://www.camecon.com)

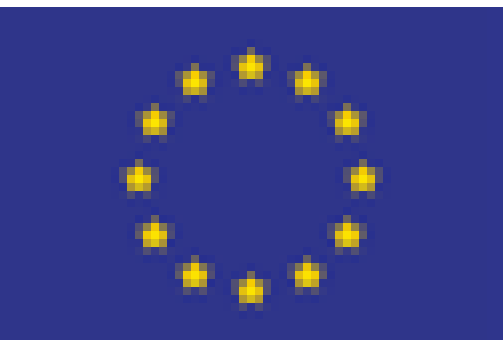


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# 3. A Catalogue of Instruments & Measures to encourage regional bioeconomy development (WP2)

Author: Ruben GUISSON (VITO)



## Objective

- To provide an On-line Catalogue allowing stakeholders to search in a targeted way for Instruments & Measures enabling regional bioeconomy development;
- To support stakeholders to develop their own strategies & business plans, and to learn from and get inspired by other regions.

## Methodological approach

- The Catalogue structure and data content was defined by VITO in close collaboration with the regional partners and with focus on data usefulness and user-friendly data-mining;
- The populating of the Catalogue with Instruments & Measures was performed by i) regional partners, ii) external stakeholders, iii) VITO & consortium partners;
- Validation and quality check was performed by VITO.

## Results

### The Catalogue and its functionalities

- The on-line Catalogue (<https://berst.vito.be/>) provides the following functionalities:
- a general search by a comprehensive set of information fields – e.g. region, type of measure, sector or topic, feed stock type, ...;
  - a search by objectives of measures relevant for the deployment of a regional bioeconomy – e.g. enabling financial resources, ensuring biomass availability,...;
  - a search by Case Studies/Good Practices providing a dashboard overview of exemplary regions – e.g. Biobase Westland, Ghent Bioeconomy Valley, Central Finland,... .

Figure 1. Example of General Search filter settings

## Results

### The Catalogue and its outcomes

Based on the selected search settings a list of relevant Instruments & Measures is returned providing key information fields.

Short name of Instrument or Measure	ISO	Country/Region	Type of Instrument & Measure	Sector/Topic targeted
Bio Innovation Growth mega Cluster	BE	VLAAMS GEWEST, NORDRHEIN-WESTFALEN, NETHERLANDS (NEDERLAND)	Platform	Clustering, co-operation and networking
Bioeconomy in Flanders	BE	VLAAMS GEWEST	Economic/financial instruments, Action Plans	Economy
Cinbios	BE	VLAAMS GEWEST	Platform	Clustering, co-operation and networking, Communication and information, Research and Innovation, Support and advisory

Figure 2. List of Instruments & Measures with key information fields as a result of selected search settings

For each listed Instrument & Measure a comprehensive factsheet with detailed information is consultable. Information tags are 'clickable' allowing to further mine the data in a targeted manner.

Figure 3. Factsheet of Instrument & Measures

### The Catalogue as an open community

To complete the Catalogue as much as possible an open community strategy was chosen. After a simple log-in you can freely add Instruments & Measures from your own region/country. After a quality check these will be published in the Catalogue.

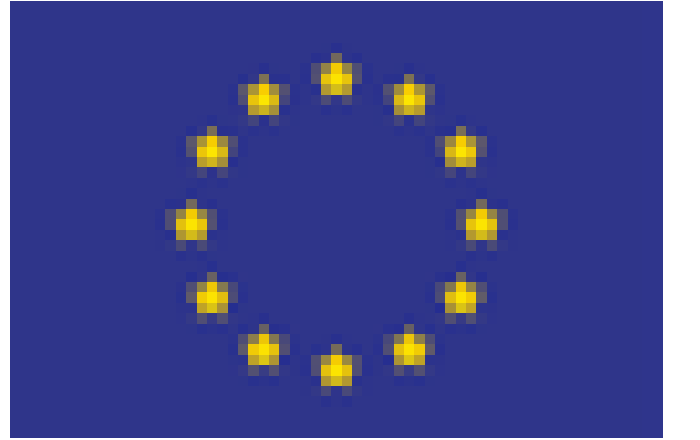
### The (current) Catalogue content in brief

Currently the Catalogue contains close to 1.000 Instruments & Measures on EU, national and regional level, 300 are dedicated to the regional level, 100 different regions are represented.



# 5. Network of BioRegions (WP5)

Authors: Remco Kranendonk and Ingrid Coninx



## Approach and Objective

In BERST, a network of BioRegions is developed by the method of Community of Practice. A Community of Practice (CoP) brings together practitioners, policymakers, companies, cluster managers and researchers to jointly explore and share experiences on the development of regional bioeconomies in Europe. The objective is to increase the mutual understanding of how actors interact with each other in bioeconomy regions and to jointly build a toolkit by finding alignments with EU regions, Member States, EU policies, institutions and networks.

## Network development activities ([www.BERST.eu](http://www.BERST.eu))

### Field visits



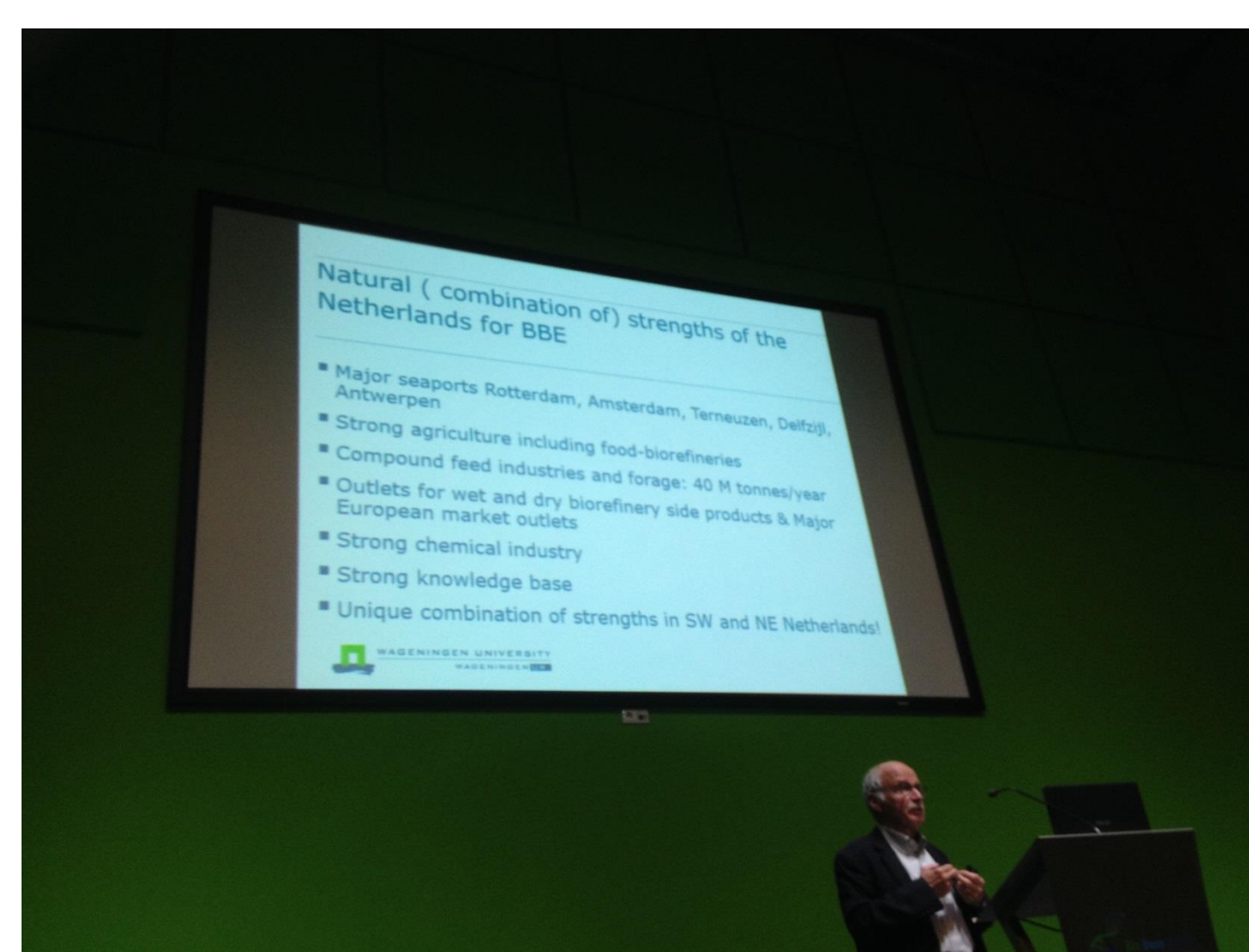
### Stories and lessons learned from regions



### Reflections from academia



### Exploring for strategic partnerships



### Brainstorm on toolkit



### Sharing and testing tools by webinars

## Alignment activities

- alignment with the Committee of the Regions – Natural Resources Working Group - Meeting Firenze;
- alignment with other Bioeconomy Regions: Sachsen Anhalt, Gelderland, South Finland, Lubelski, Dutch network of Bioregions;
- taking part in the EU discussion on Bioeconomy: TOBE Bioeconomy Stakeholder meeting Torino, ERRIN biobased working group events, Scar Working Group, Open Days;
- exchange with Committee of the Regions, European Parliament, Bioeconomy Observatory, JRC, Platform S3.



## Results

- science – regions interaction and co-creation;
- network of almost 200 members;
- BERST is on the EU agenda;
- partnerships with ERRIN;
- alignment with EU institutions;
- connected to EU discussions and challenges.

## Current challenges of the Bioregions Network for future bioeconomy development

- In many regions, RIS3 strategic choices are made prior to the BERST project. The BERST tools and information on bioeconomy criteria and comparative advantages can be used to continue the RIS3 process and to strengthen and improve the regional dialogue on the strategic choices;
- Outreach of the testing and use of BERST tools in other bioregions;
- Stay connected to EU institutions and platforms (ERRIN, BBI, CoR, Scar, JRC, Observatory, Stakeholder Conferences, etc.);
- Ongoing aspirations for interregional partnerships, for benchmarks, exchange, collaboration, connection of the value chain, strategic positioning.



Name: Wageningen UR Alterra  
Contact: Remco.Kranendonk@wur.nl  
T + 31 (0)317 48 19 38  
[www.wageningenUR.nl](http://www.wageningenUR.nl)

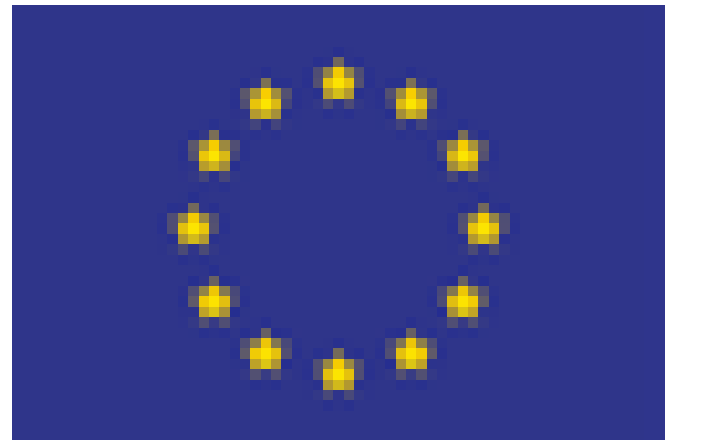


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# 6. Towards a bioeconomy cluster in Keski-Suomi (Finland)

Authors: Hannu Koponen, Hilkka Laine, Anneli Ylimartimo and Laura Vertainen



## Current state of the bioeconomy cluster

### Start and aim

The bioeconomy cluster in Keski-Suomi started in 1992 as a cooperation of R&D institutes, the Regional Council of Central Finland and entrepreneurs. The cluster aims at valorizing the forest biomass resources, especially in the bioenergy sector. Recently the focus has changed towards industrial symbiosis, in particular with the pulp and paper industry.

### Cluster Board

The cluster board, comprising R&D institutes, entrepreneurs and policymakers, provided focus and steered developments in the cluster. This resulted in good interactions and successful collaboration among the cluster actors.

### Entrepreneurial climate

Entrepreneurs showed a high willingness to develop the bioeconomy and to pool resources towards new product development, amongst others by converting industrial waste from the primary processing of biomass resources into marketable products. By doing so, crossovers took place.

### Funding

The cluster is financed by public funding linked to national policy to create and maintain jobs in rural areas and to national and EU R&D and bioeconomy policies. Private funding became available from the drive to maturity stage.



## Barriers for the development of the bioeconomy cluster

- a low rate of start-ups in forest fuel production due to the small scale firm structure;
- the fragmented nature of the bioeconomy sectors hampers cross-overs;
- the perspective of the biocluster is rather national, and international cooperation at SME level is at a moderate level;
- road infrastructure shows some inadequacies, which hampers the transport of biomass resources.

## Structure of regional bioeconomy

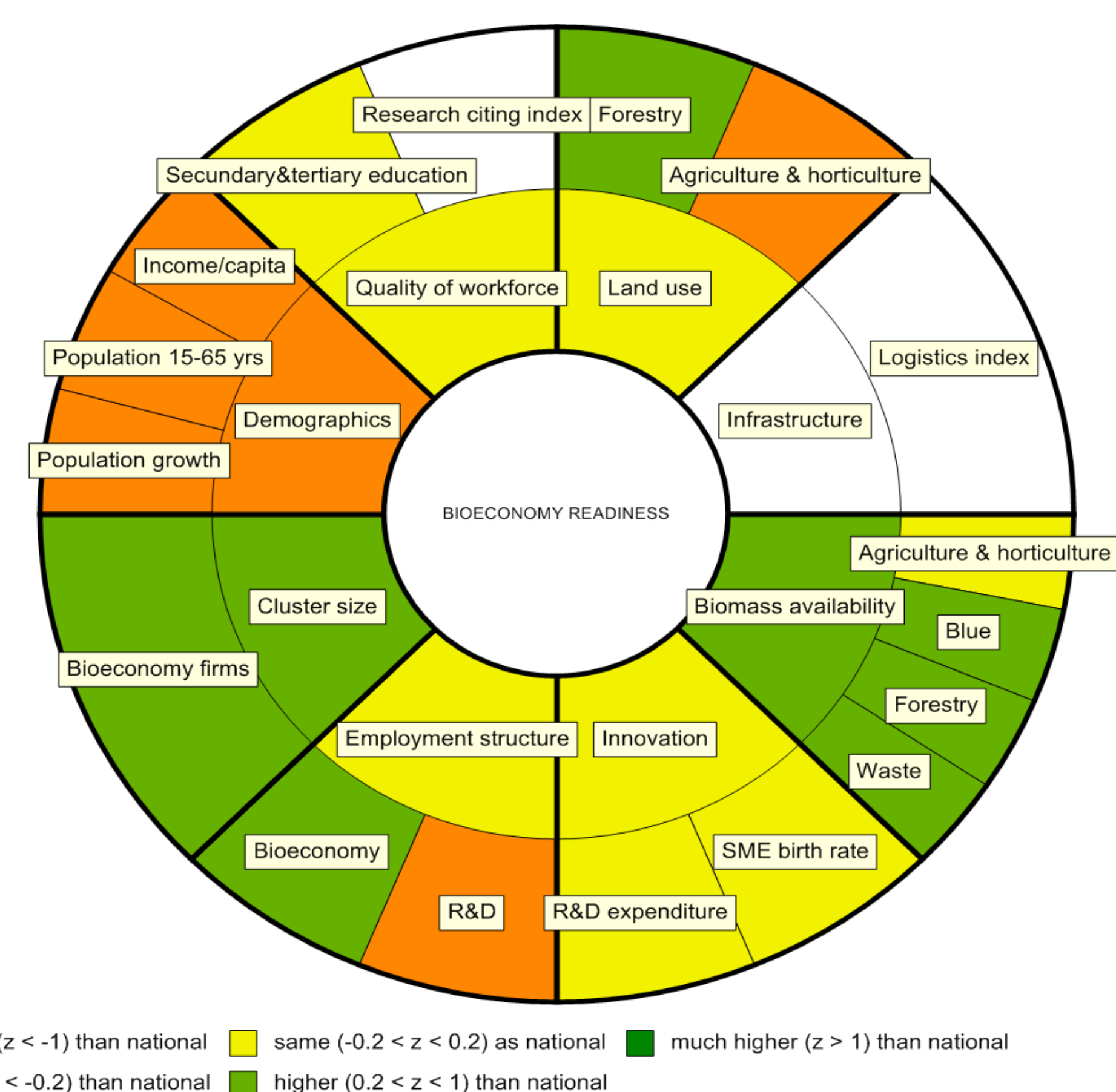


Figure 1 Bioeconomy readiness for Keski-Suomi compared to Finland

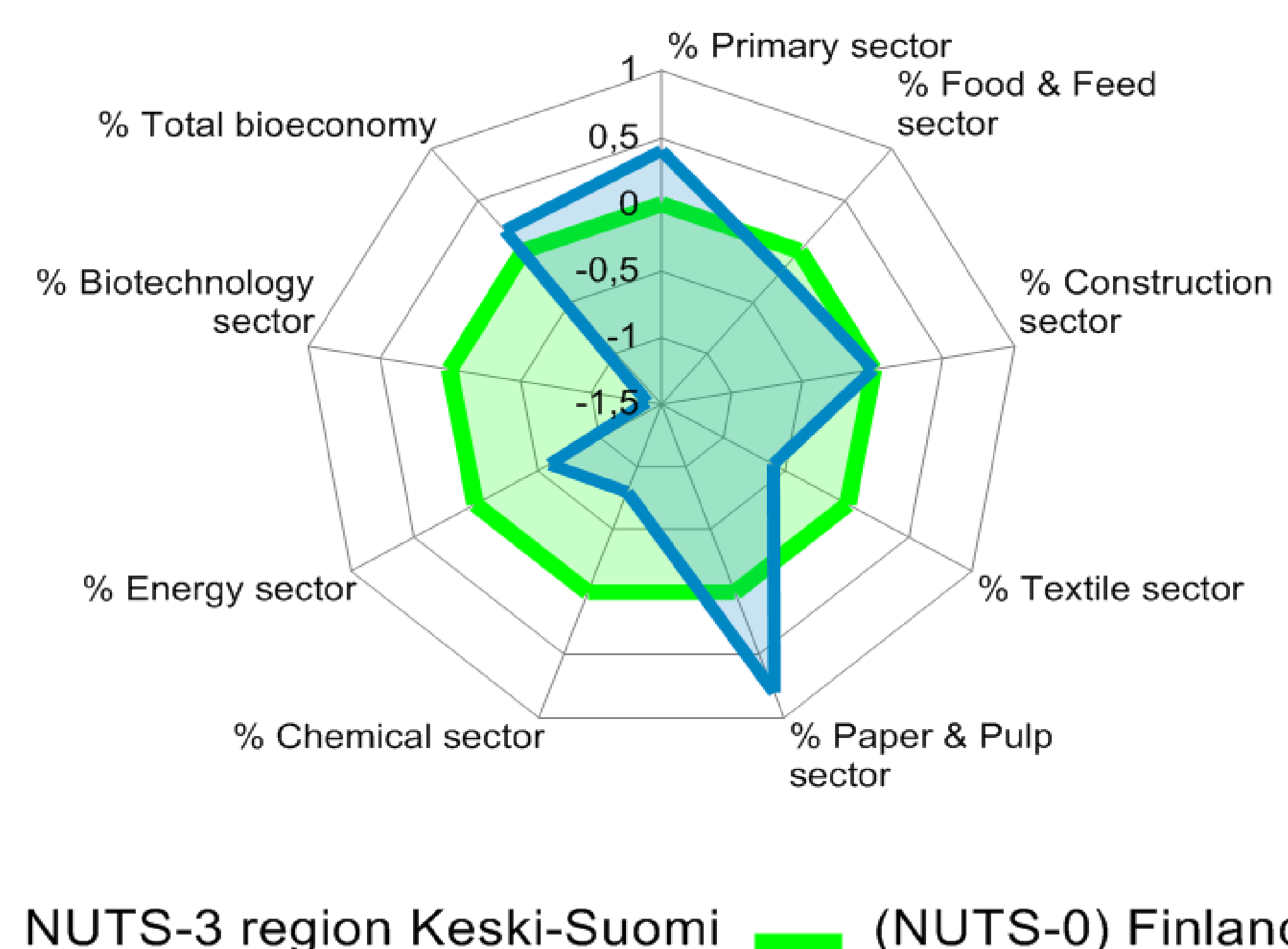


Figure 2 Employment structure (%) in Keski-Suomi compared to Finland

## Recommendations for further development of the bioeconomy cluster

- ensure that the role of the cluster coordinator is sustained and reinforced to keep momentum of the cluster;
- enrich service orientation towards the companies in the cluster;
- design and reinforce educational programs to raise interest for bioeconomy activities among students;
- perform gap analysis on skills from an industrial perspective and work together to integrate courses and human resources to the particular sectors of interest;
- improve the role of an incubator in the bioeconomy cluster;
- place effort and funds towards reinforcing the road and rail infrastructure for supply of biomass resources;
- improve the resource efficient exploitation of wood industry raw material side streams and the integration of waste in the bioeconomy value chains;
- strengthen the international contacts of the cluster.



Regional Council of Central Finland,  
Cygnauksenkatu 1, FI 40100 Jyväskylä, FINLAND.  
Contact: hannu.koponen@keskisuomi.fi  
www.keskisuomi.fi



JAMK University of Applied Sciences  
Rajakatu 35, FI 40200 Jyväskylä, Finland  
Contact: laura.vertainen@jamk.fi  
www.jamk.fi

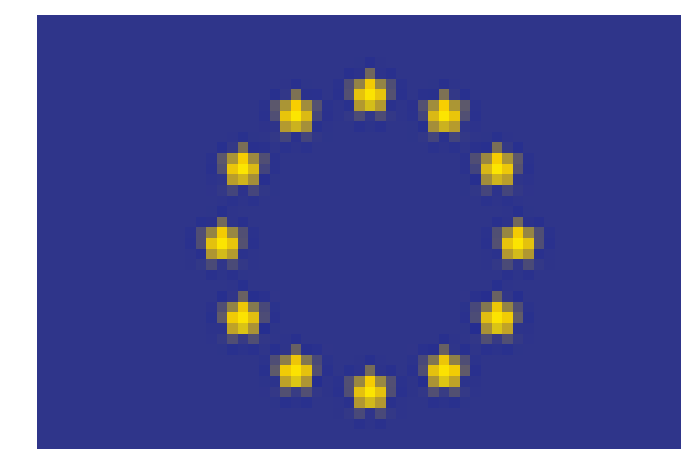


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# 7. Towards a bioeconomy cluster in Straubing (Germany)

Authors: Ann-Kathrin Kaufmann and Senta Schmatzberger



## Current state of the bioeconomy cluster

### Start and aim

The Straubing-based cluster "Renewable Raw Materials" was initiated in 2009 as a politically-led top-down initiative. The cluster is managed by the BioCampus Straubing GmbH, which closely works together with the state-run Competence Centre for Renewable Raw Materials in Straubing. As a flagship activity, a lignocellulosic ethanol demoplant has been built on the BioCampus in the Straubing port area in 2012 by Clariant. The cluster is located in an agriculture and forestry-rich region and there is a direct inland waterway access via the Danube port. The cluster aims to transform biomass resources into competitive biobased products in the energy and chemical sectors.

### Cluster Board

The BioCampus Straubing GmbH, that has the role of cluster management, is mainly oriented at research and education, technology transfer, site development and marketing. It does currently not provide support for fund raising to the cluster members.

### Entrepreneurial climate

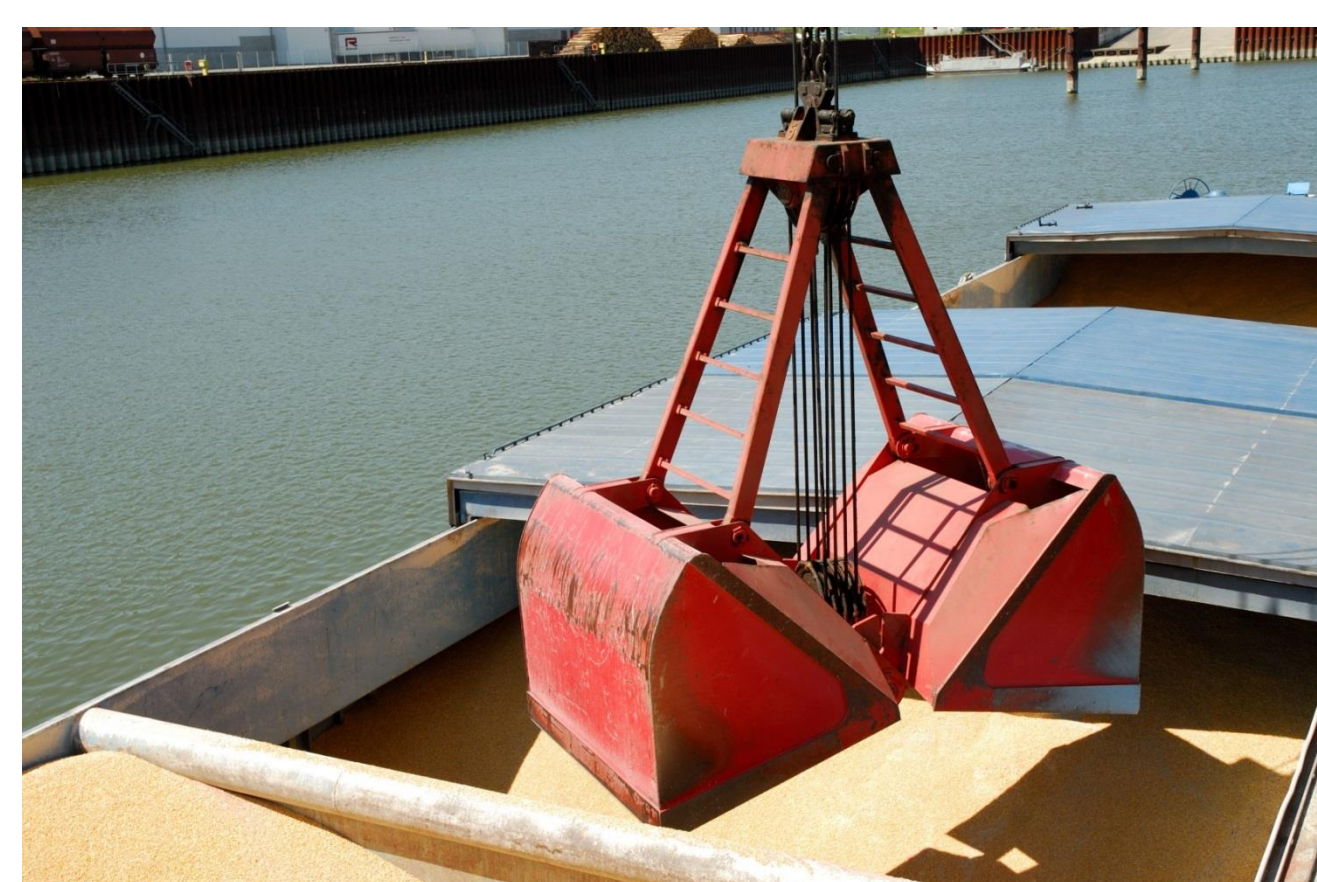
The Straubing cluster currently has approximately 100 members with the majority being from the private sector. However, entrepreneurs do not actively participate in the cluster, as appreciation of offered cluster services is missing.

### Funding

The cluster lacks financial stability: until now it only received temporary and limited project funding from EU, national, regional and local funds.



Clariant sunliquid© demoplant



Biomass handling at Straubing's Green Chemistry Belt

## Barriers for the development of the bioeconomy cluster

- lack of active participation of entrepreneurs in the cluster as they insufficiently appreciate the cluster due to its top-down character;
- R&D actors are not always able to translate research results into business applications;
- comparatively high prices for biomass resources for bioeconomy purposes due to competition with other users of biomass resources
- farmers lack an incentive to sell their biomass resources to bioeconomy firms;
- lack of shared innovation culture among entrepreneurs;
- low prices for fossil fuels hamper the commercial drive to develop and market biofuels;
- lack of support to the cluster members by the cluster board in getting access to funding;
- lack of consistent, reliable funding for the cluster management;
- the perspective of the biocluster is rather regional and mainly neglects national and international cooperation.

## Structure of regional bioeconomy

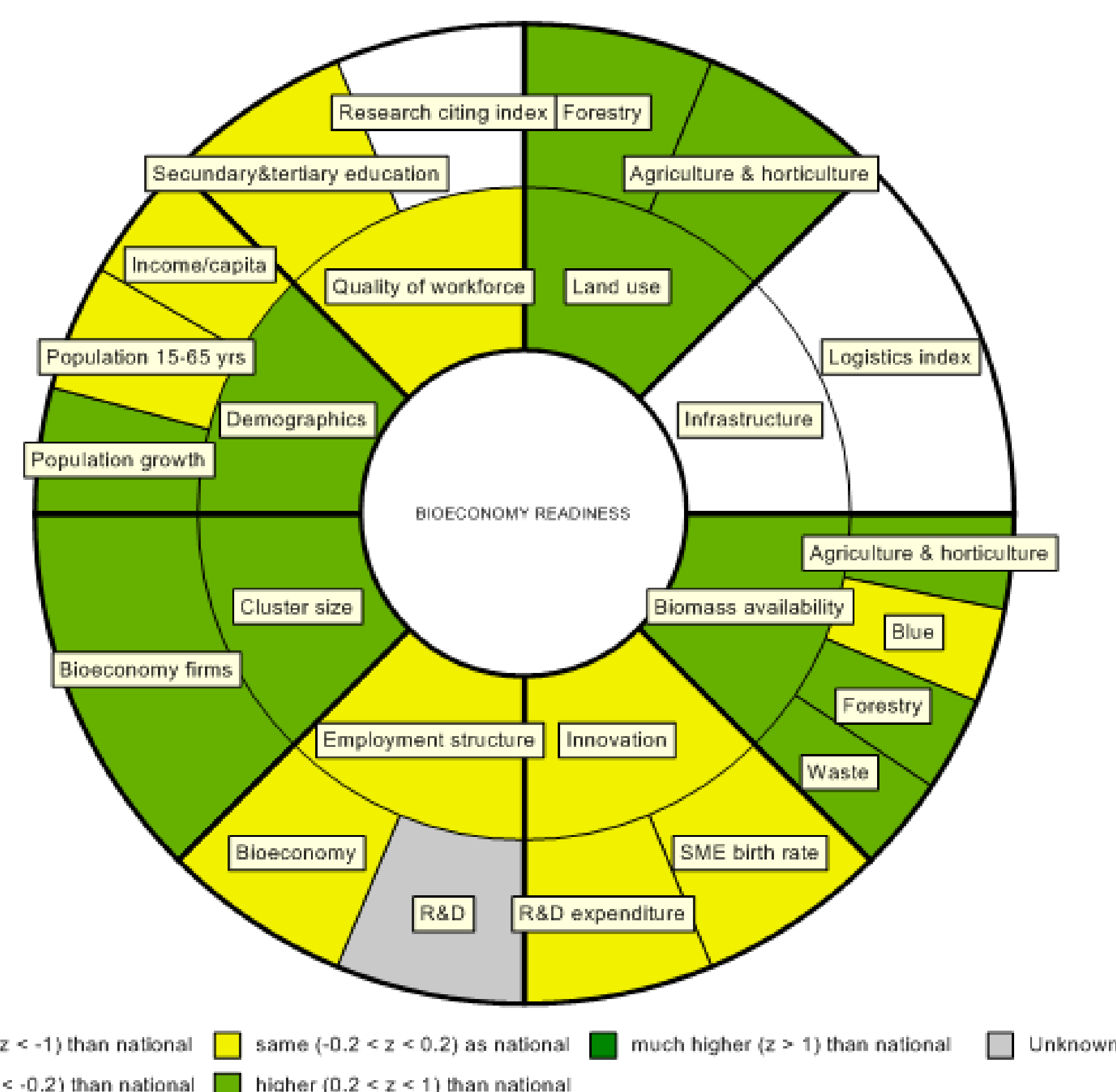
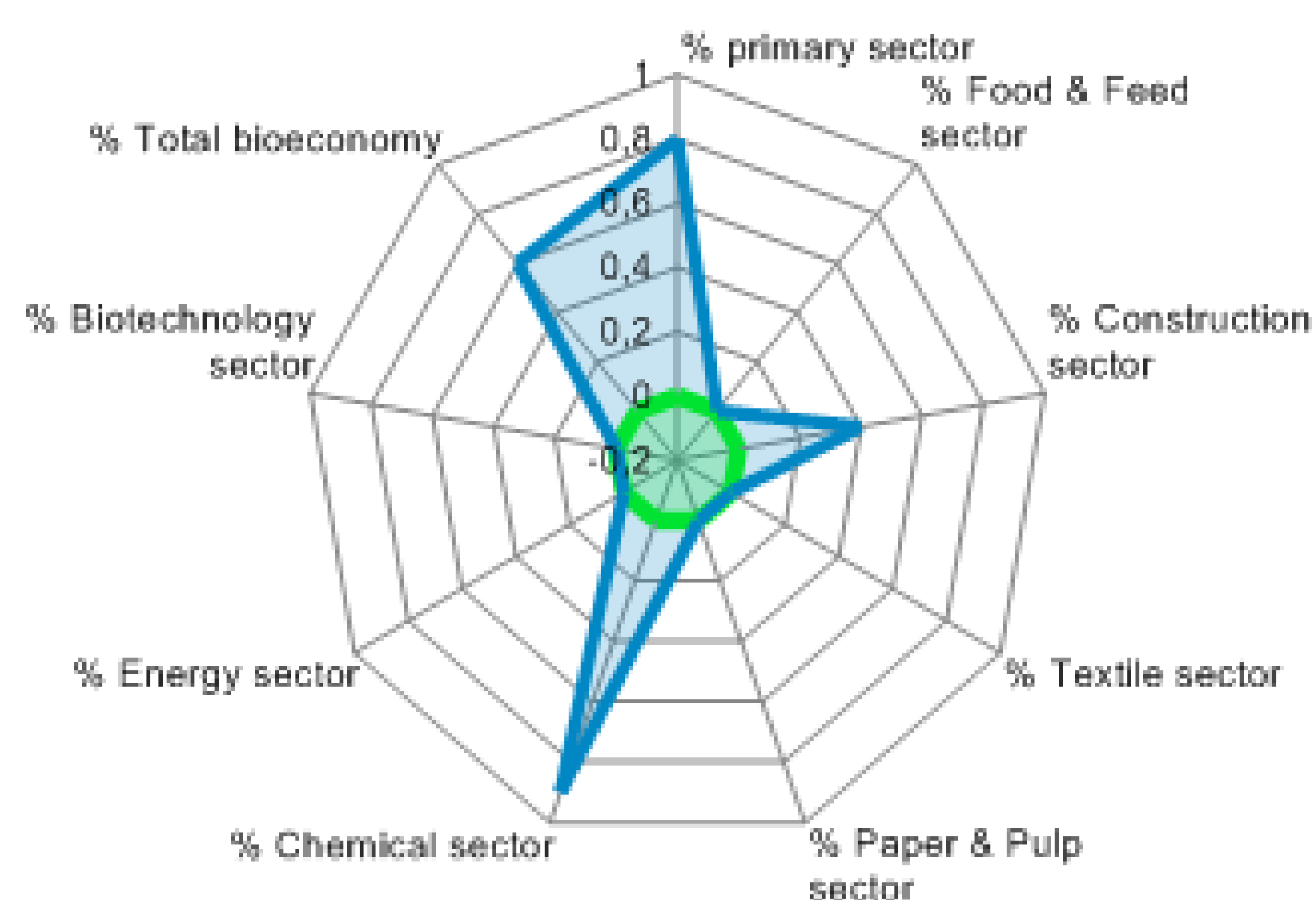


Figure 1 Bioeconomy readiness for Straubing region compared to Germany



— NUTS-3 regions total — (NUTS-0) Germany

Figure 2 Firm structure (%) in Straubing region compared to Germany

## Recommendations for further development of the bioeconomy cluster

- strengthen the entrepreneurial climate by improving the capacity of the entrepreneurs;
- improve the translation of research results into business applications;
- solve bottlenecks in the supply of biomass resources as much as possible;
- improve access to public funding, including support in completing applications and funding for start-ups;
- focus on national and international cooperation as well.



BioCampus Straubing GmbH  
Europaring 4  
D-94315 Straubing  
Contact:  
ak@biocampus-straubing.de  
T + 49 (0)94215 785 161  
www.straubing-sand.de/biocampus



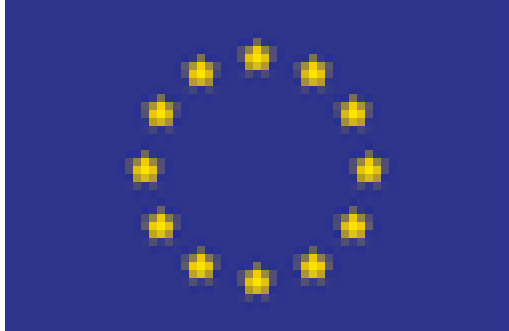
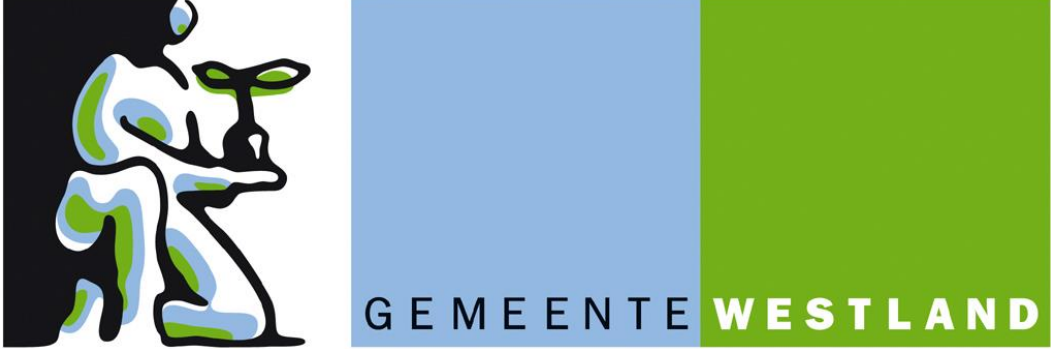
Fachagentur Nachhaltige Rohstoffe e.V.  
OT Gültzow  
Hofplatz 1  
D-18276 Gültzow-Prüzen  
Contact: s.schmatzberger@fnr.de  
T +49 3843 6930-0  
T +49 (0)3843 6930 0  
www.fnr.de





# 8. Towards a bioeconomy cluster in Bio Base Westland

Author: Judith Zuiderwijk



## Current state of the bioeconomy cluster

### Start and aim

The Westland region is a main centre of greenhouse horticulture. The municipality of Westland took the initiative to start a bioeconomy cluster in 2013 with the intention to use residue materials from greenhouse horticulture and to grow new crops with valuable ingredients. At the moment, the municipality is exploring the perspectives of a wide range of biobased products with high value added.

### Cluster Board

The municipality chairs the steering committee of Bio Base Westland.

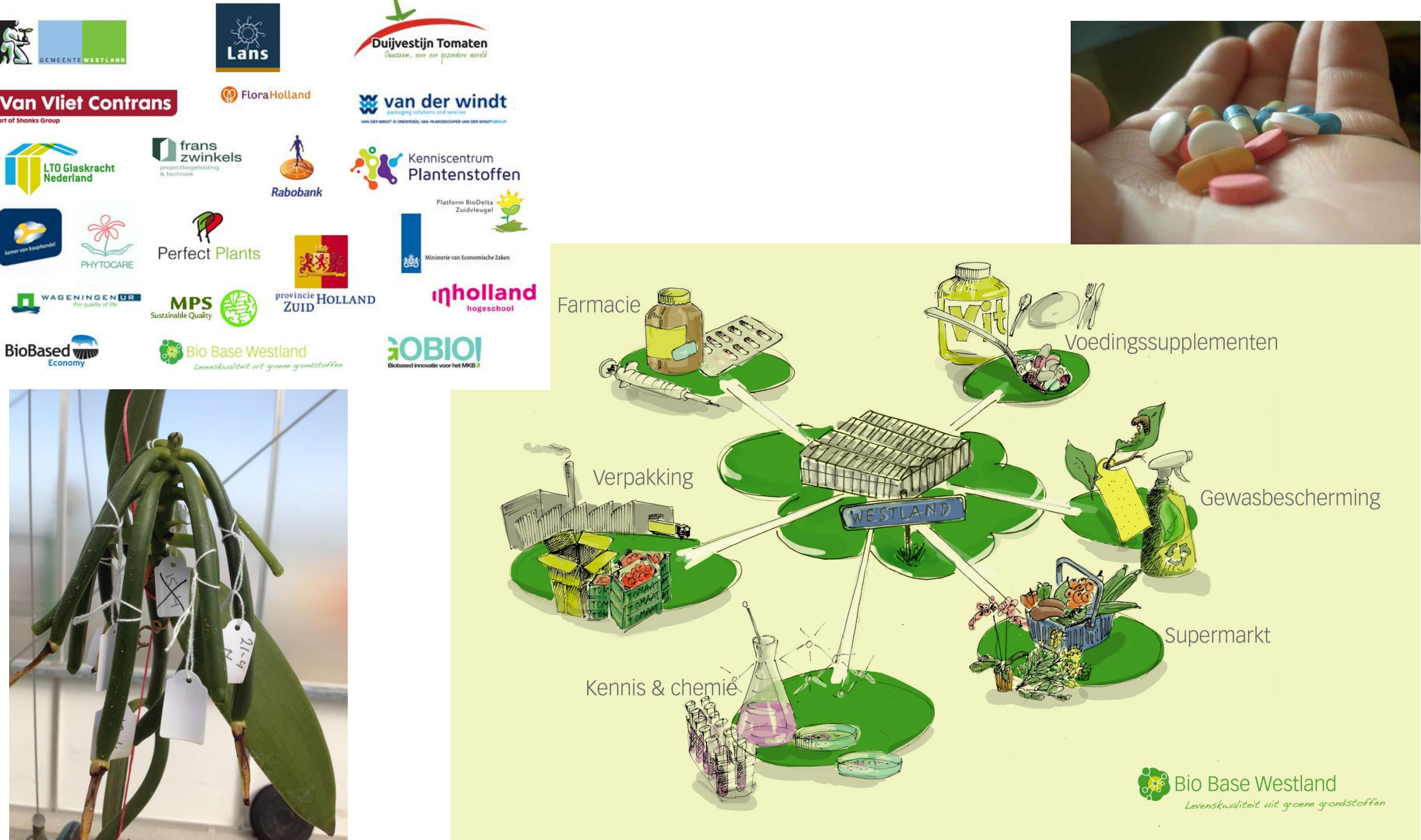
### Entrepreneurial climate

Bio Base Westland works with a small group of entrepreneurs who are willing to develop and market bioeconomy products based on new crops or horticultural waste. One of the projects of Bio Base Westland is bringing together a group of actors, who developed and produced cardboard boxes from tomato stems.

### Funding

Financing originates from regional, national and EU public funds.

## Partners and vision of Bio Base Westland



## Structure of the regional bioeconomy

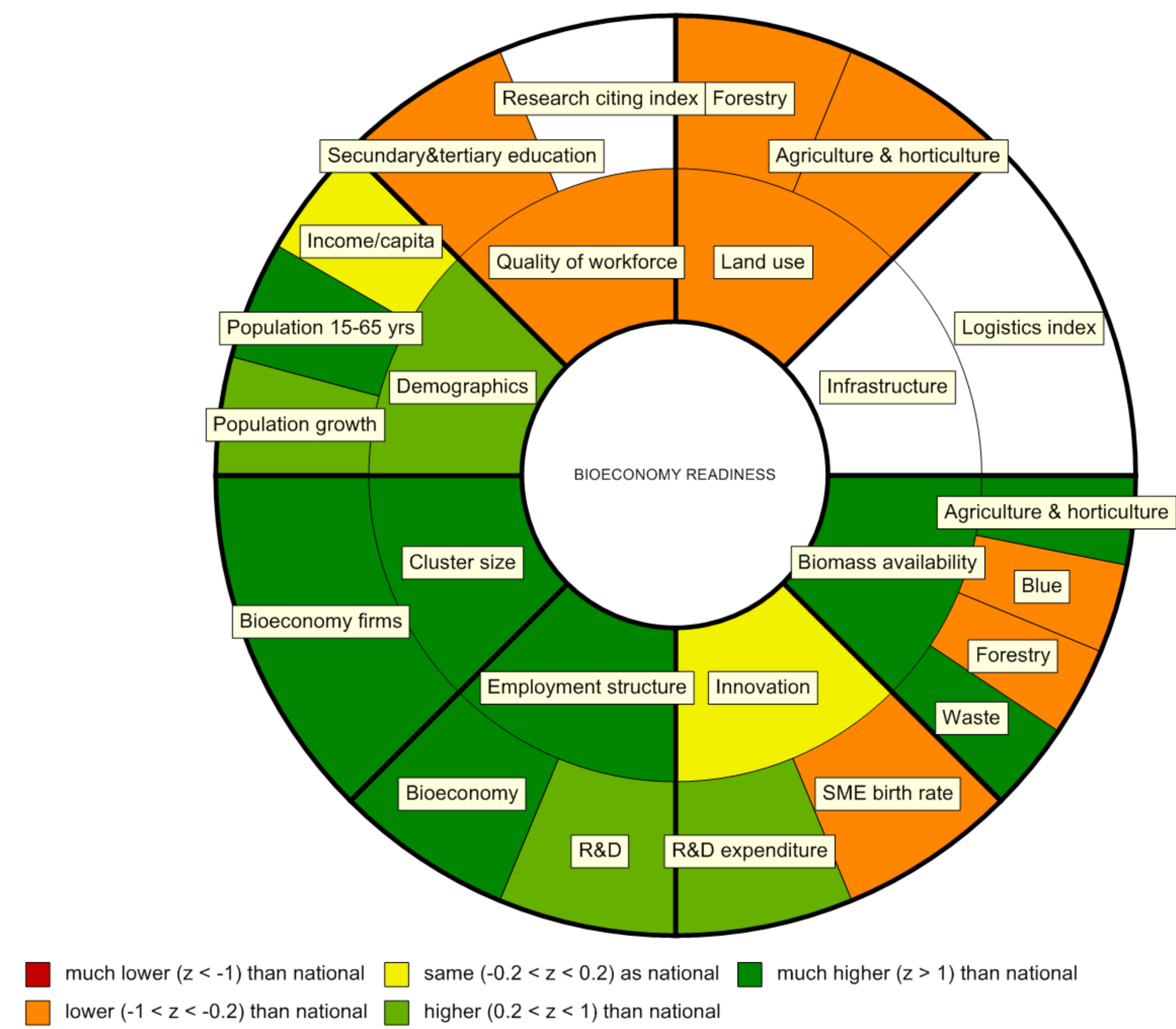


Figure 1 Bioeconomy readiness for Delft and Westland compared to Netherlands

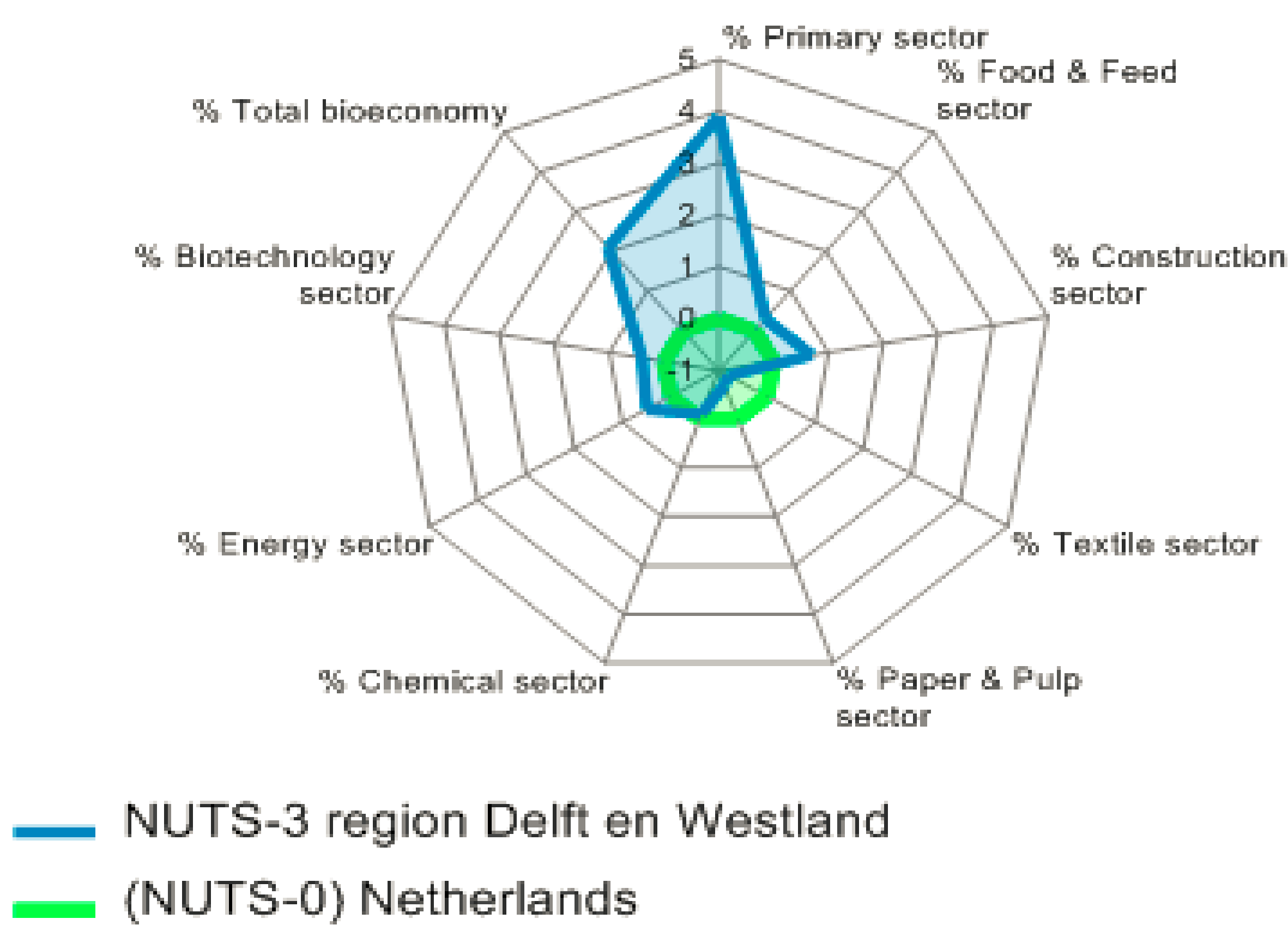


Figure 2 Employment structure (%) in Delft and Westland compared to Netherlands

## Barriers for the development of the bioeconomy cluster

- The bioeconomy cluster is mainly set up as a top-down initiative in an environment of entrepreneurs of which only a small group is active in the biobased economy;
- The potential of horticultural crops as input for competitive bioeconomy products is not widely known among entrepreneurs in cosmetics and pharmacy.

## Recommendations for further development of the bioeconomy cluster

1. Bio Base Westland could set up an entrepreneurs platform to involve more entrepreneurs in the bioeconomy;
2. Bio Base Westland could put efforts in promoting the potential of horticultural products as a base for competitive bioeconomy products among entrepreneurs;
3. Bio Base Westland operates in a region with other active parties in developing the bioeconomy, like Biobased Delta South-Holland. Synergy effects could arise from cooperation.



Name: Gemeente Westland  
Contact: [judithzuiderwijk@gemeentewestland.nl](mailto:judithzuiderwijk@gemeentewestland.nl)  
T + 31 (0)174 672315  
[www.biobasewestland.nl](http://www.biobasewestland.nl)

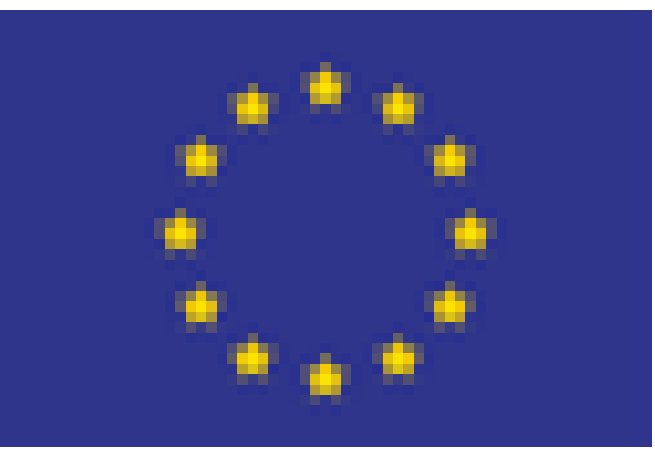


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# 9. Towards a bioeconomy cluster in Biobased Delta (the Netherlands)

Author: Peter Bijkerk



## Current state of the bioeconomy cluster

### Start and aim

Biobased Delta was set up as an informal collaboration of the provinces of Zeeland and North Brabant in 2010; the province of South Holland joined in 2014.

### Cluster Board

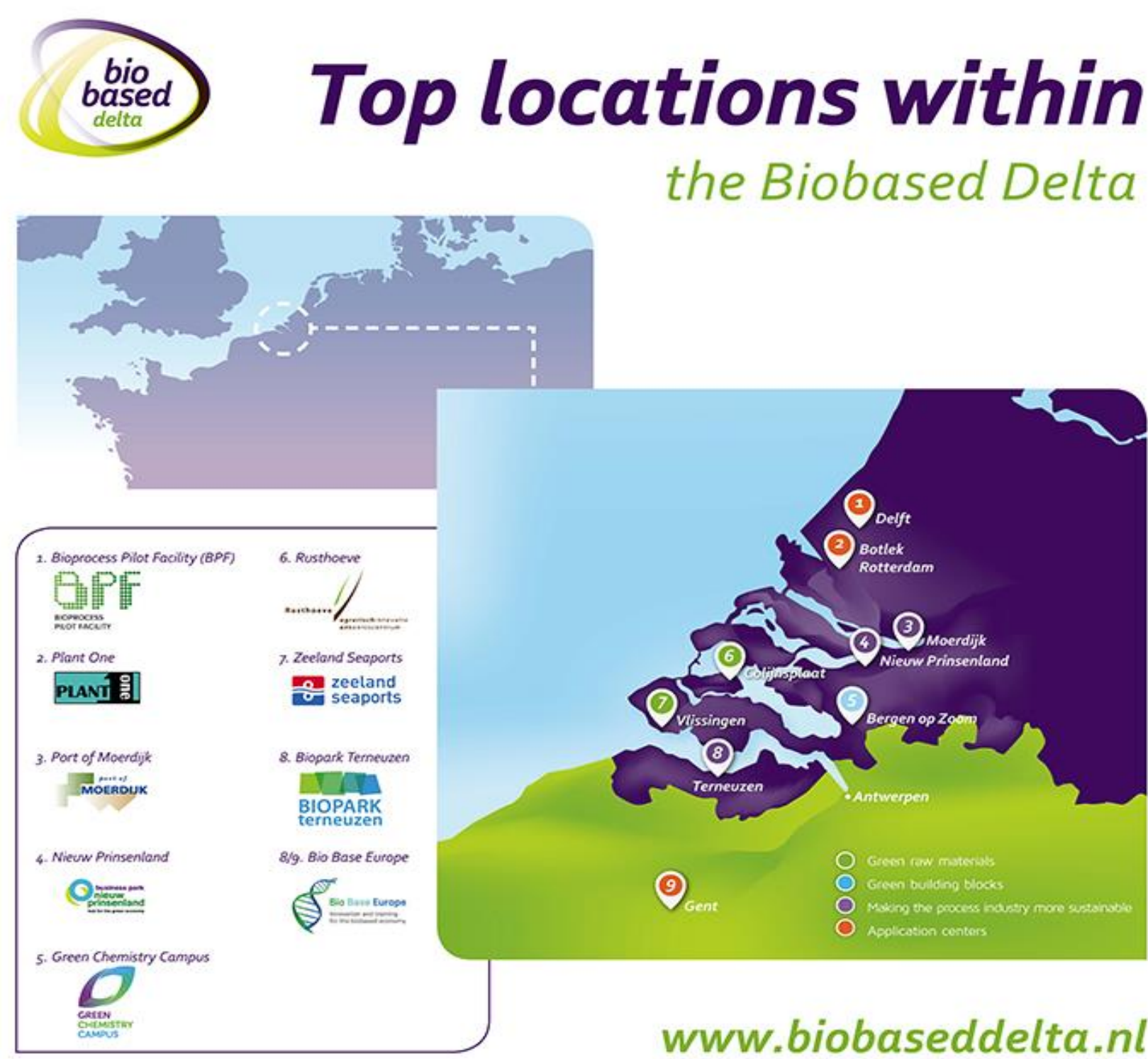
Biobased Delta, which is mainly financed by provincial funds, has a board and a director. Biobased Delta is both a bioeconomy cluster and a broker that connects small and large actors. Moreover, Biobased Delta provides focus to the bioeconomy activities in the region by organizing the common agenda 'Agro meets Chemistry'.

### Entrepreneurial climate

The three provinces covered by Biobased Delta combine a strong agricultural sector, a large and innovative agro-food industry, a large chemical industry and extensive well-developed infrastructure, including deep sea harbours. Given these favourable conditions, new bioeconomy and biobased activities do and will emerge in the region. However, the support and steering from the Biobased Delta platform enhances concerted actions in the triple helix that are needed to establish a biobased economy in the region at a large scale. The entrepreneurial climate is enhanced by the focus of Biobased Delta on the following five pillars: Business Development, Human Capital and Education, Infrastructure (including top locations, incubators and application centers for SMEs), Policy & Promotions and Funding (subsidies, venture capital).

### Funding

Financing originates from regional, national and EU public funds.



## Structure of the regional bioeconomy

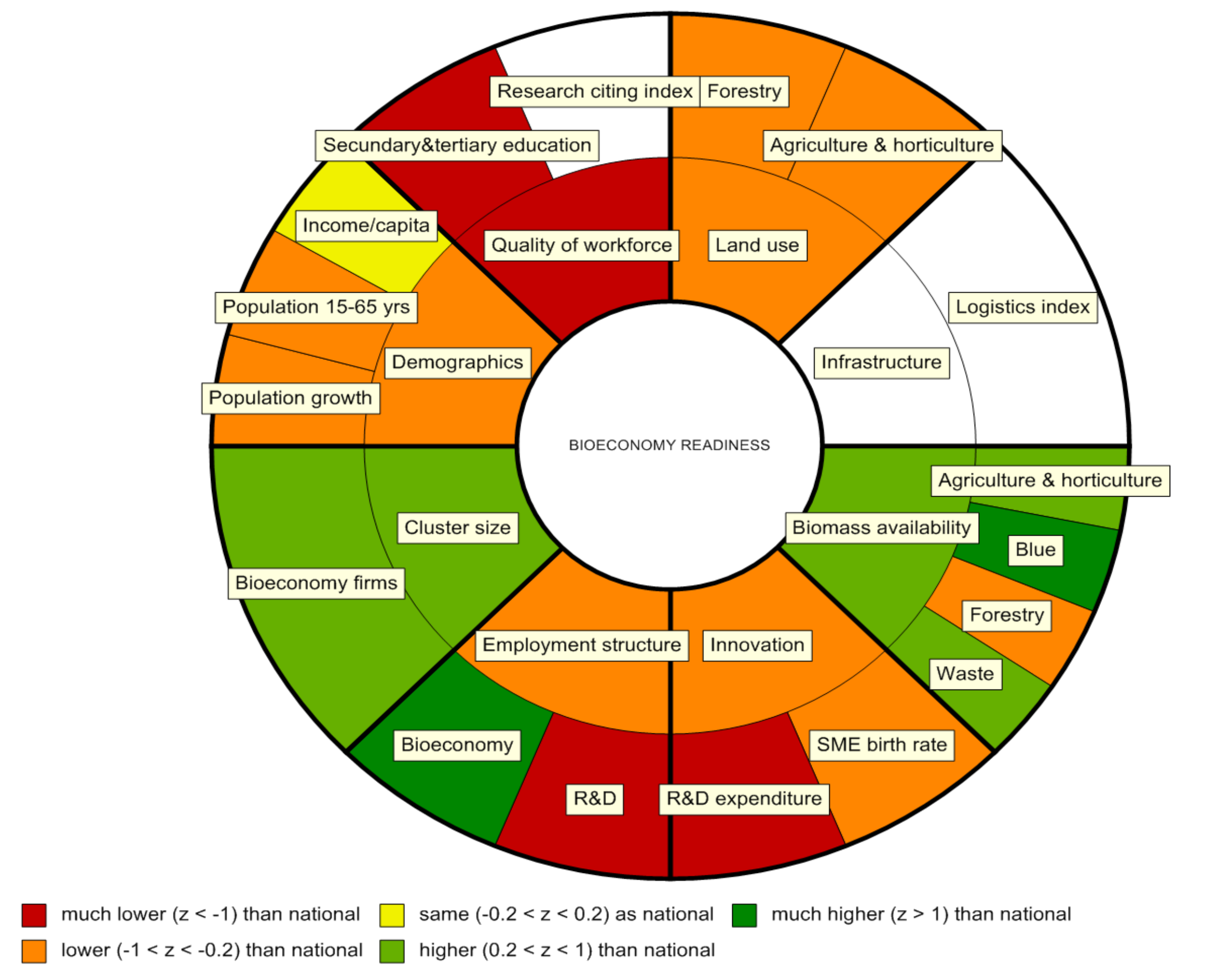


Figure 1 Bioeconomy readiness for Biobased Delta compared to Netherlands

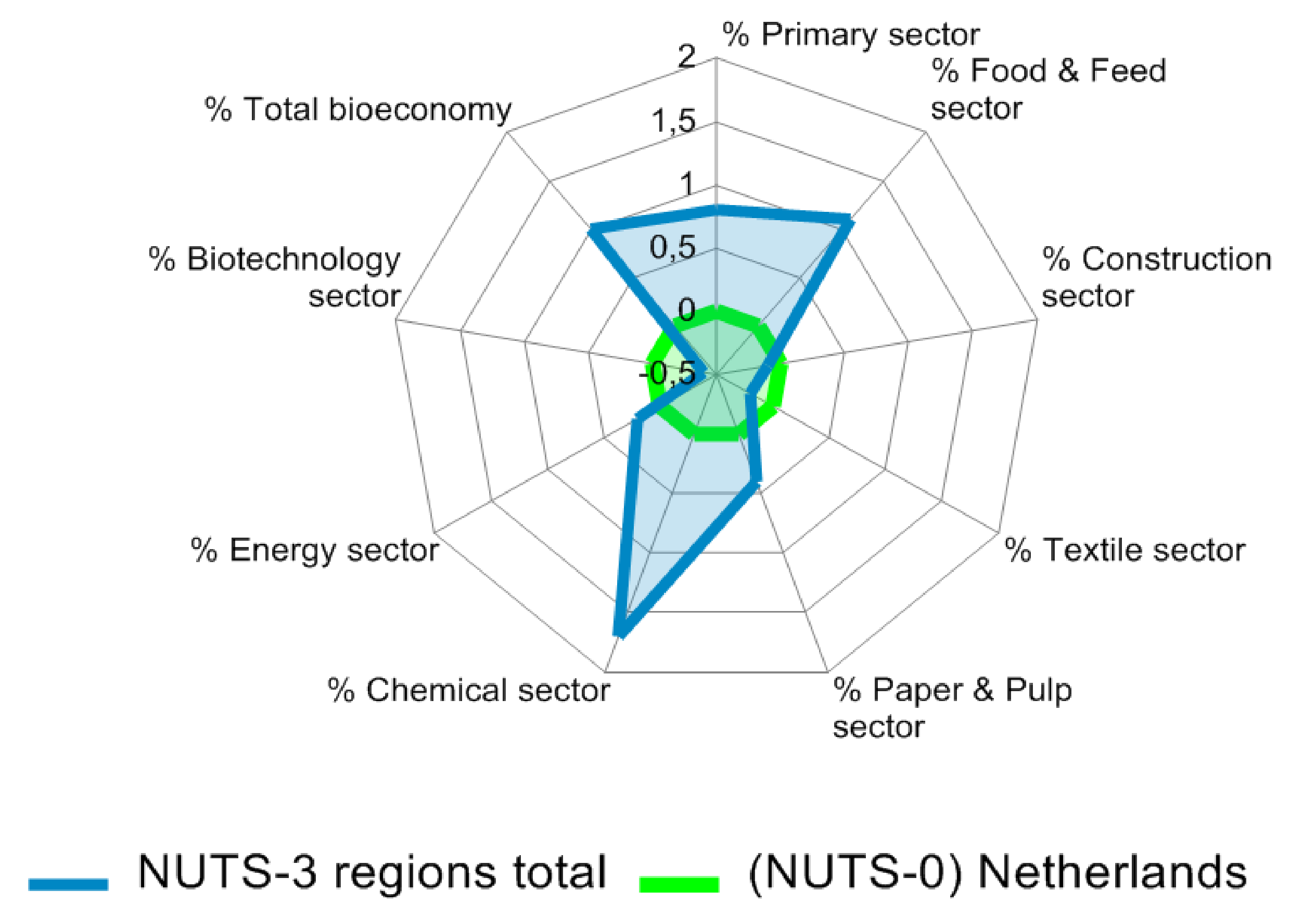


Figure 2 Employment structure (%) in Biobased Delta compared to Netherlands

## Barriers for the development of the bioeconomy cluster

- relatively little initiative from the traditional, fossil-based, chemical industry, amongst others due to the fact that biobased products have to compete with fossil-based products;
- no level playing field for the use of biomass for biobased products versus the use in energy production (SDE subsidies for sustainable energy; no subsidy for sustainable chemicals or materials);
- there is insufficient woody biomass in the region for large scale lignocellulose biorefinery activities, but the availability of deep sea harbours compensates for that.

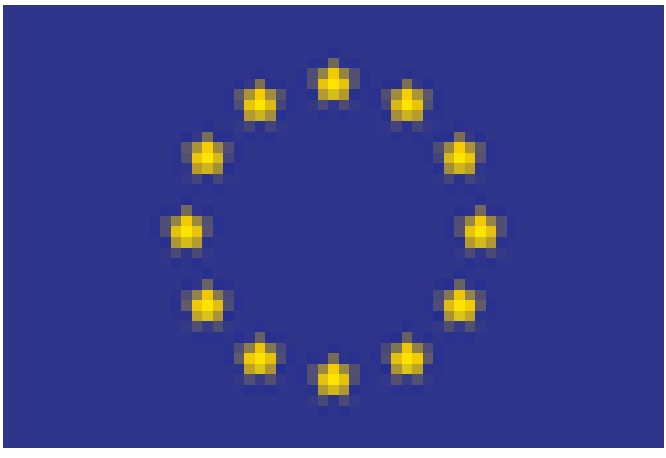
## Recommendations for further development of the bioeconomy cluster

- strengthen the role of Biobased Delta as platform that provides focus to the bioeconomy activities in the region;
- strengthen the role of Biobased Delta as broker who connects actors at their own request to other actors.



# 10. Towards a bioeconomy cluster in the Comunidad de Madrid (Spain)

Authors: David Arbelo and Dolores Julián Artero



## Current state of the bioeconomy cluster

### Start and aim

In 2007, Madrid Regional Government promoted the incorporation of eleven cluster associations for those economic sectors identified as strategic for the Region. The aim of the clusters is to improve competitiveness of the economy of Madrid. The Biotechnology Cluster and the Renewable Energy and Sustainability Cluster are closely related to the bioeconomy. From the start of the clusters, all significant regional agents such as policymakers, knowledge providers, technology generators and entrepreneurs have been involved in the day-to-day activities.

### Cluster Board

Cluster structure and governance are designed with an open and collaborative philosophy. Representatives from all regional agents are included in the boards.

### Entrepreneurial climate

Entrepreneurial activity in Madrid Region is well above Spanish national average. Services and technology represent the most dynamic sectors. Due to the top-down driven nature of the clusters, coordination among different innovation agents has been slow and differences in culture still hamper collaboration of R&D actors and entrepreneurs. However, the existence of a Science Park in the Biotechnology Cluster, has demonstrated that proximity of firms encourages mutual cooperation.

### Funding

The clusters respond actively to items on the regional political agenda, such as tax incentives for companies with R&D activities in bioeconomy, promotion of infrastructures dedicated to R&D in biotechnology, soft credits for start-ups in the biotech and renewable energy sector and incentives to promote domestic use of biomass boilers, as well as to the EU renewable energy policy.



## Barriers for the development of the bioeconomy cluster

- bioeconomy clusters were set up as a politically-led top-down initiative. Therefore entrepreneurs and R&D institutes have shown until recently a low sense of ownership of the cluster;
- lack of active participation of entrepreneurs in the cluster;
- insufficient public and private funds to support the clusters;
- weak cooperation and lack of trust among firms and R&D institutes.

## Structure of the regional bioeconomy

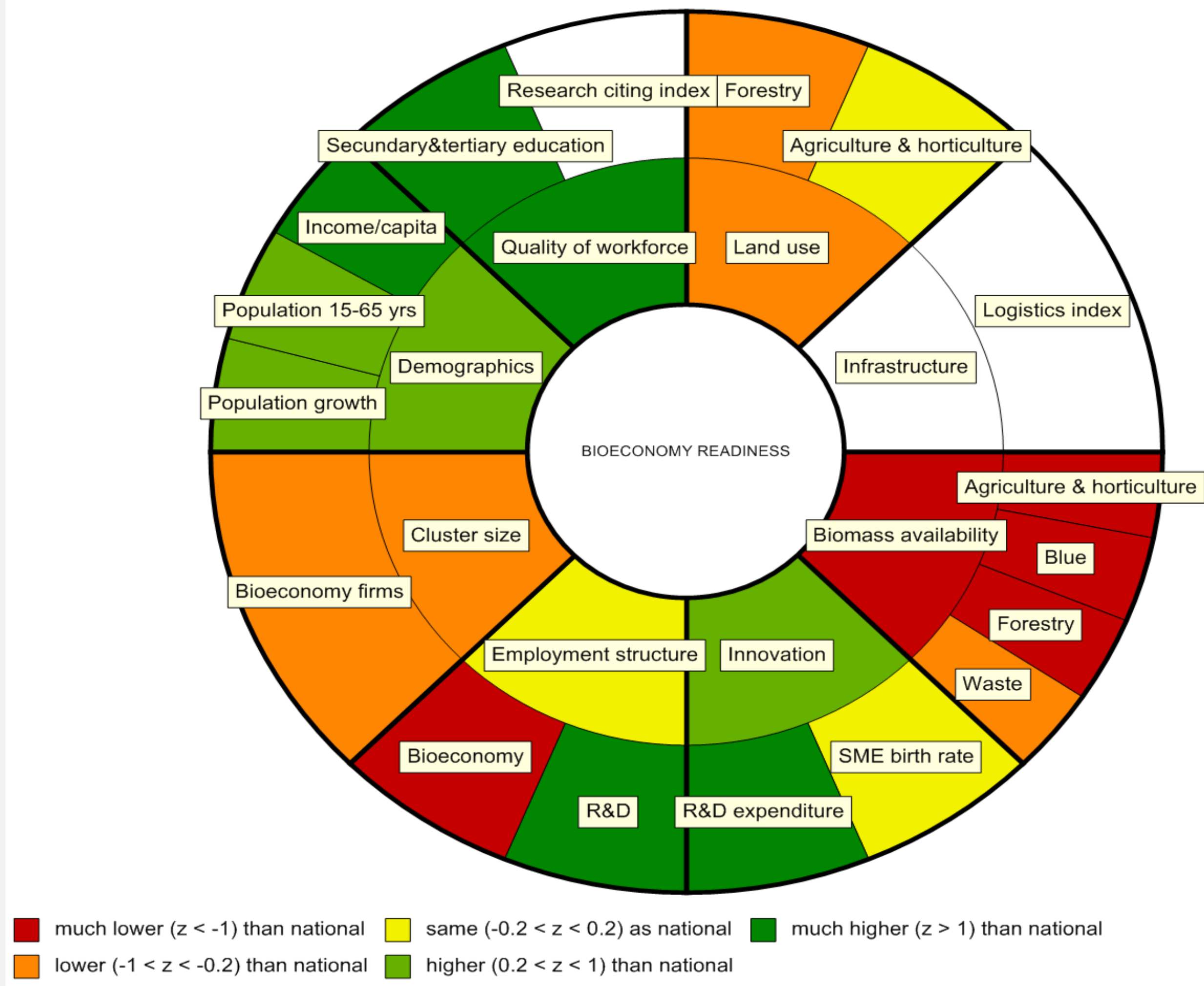


Figure 1 Bioeconomy readiness for Comunidad de Madrid compared to Spain

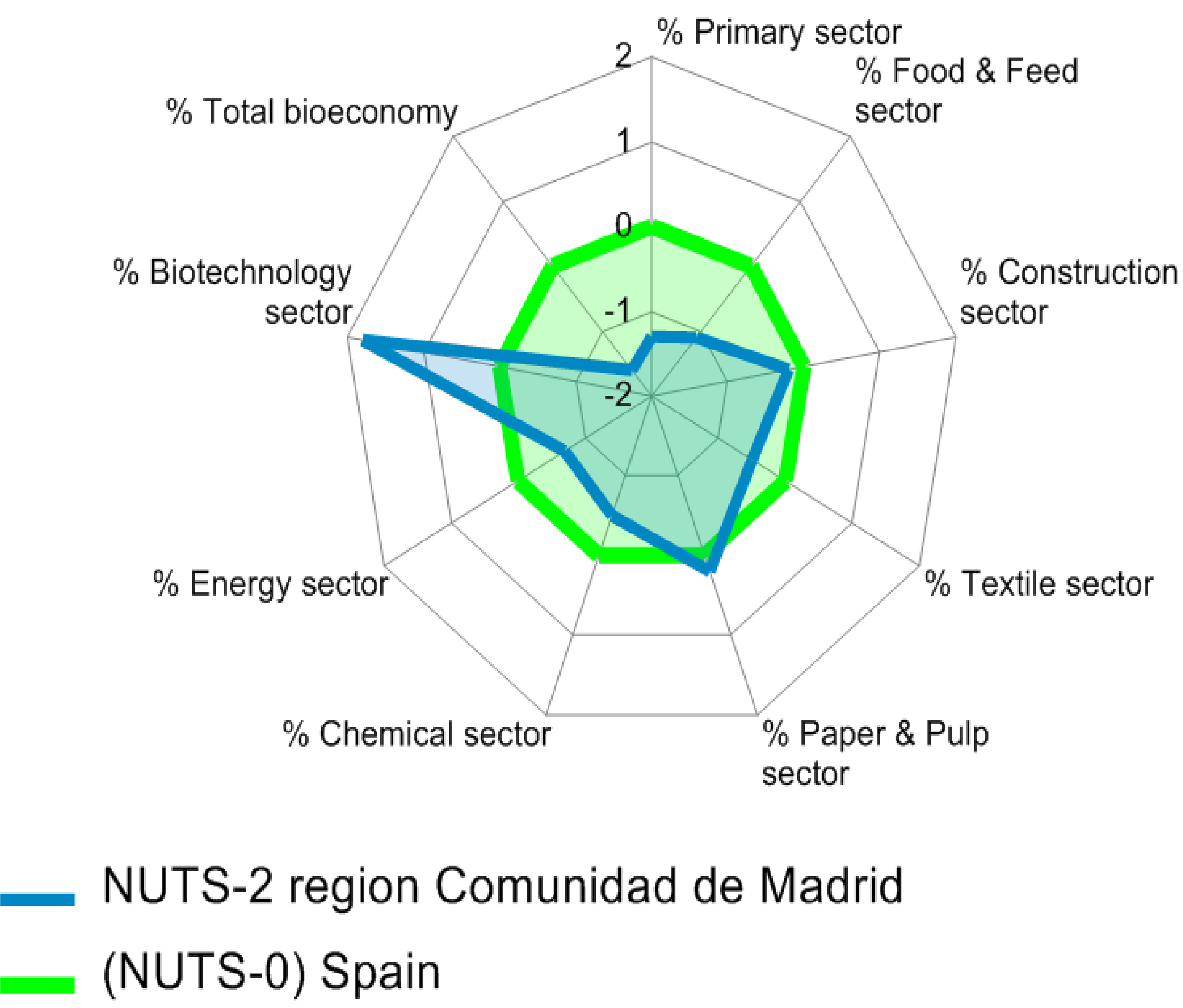


Figure 2 Employment structure (%) in Comunidad de Madrid compared to Spain

## Recommendations for further development of the bioeconomy cluster

- increase the capacity of local actors by promoting cooperation and the use of network tools;
- encourage local actors to assess their situation in a broader local and global context;
- promote the use of common infrastructures to build trust through engagement among firms and R&D institutes.



Name: Fundación Parque Científico de Madrid  
C/Faraday 7, campus Cantoblanco Madrid 28049  
Contact: david.arbelo@fpcm.es  
T + 34 911 169 946  
www.fpcm.es

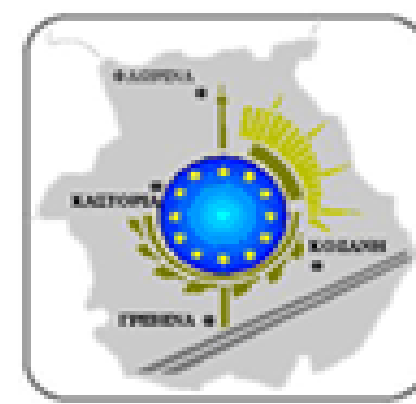


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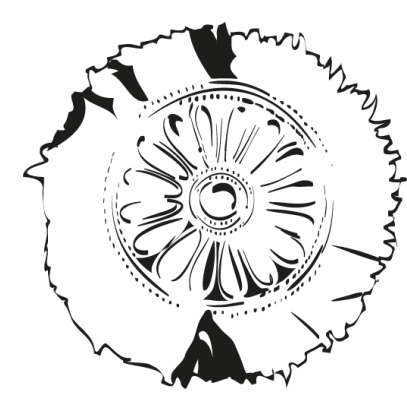


# 11. Towards a bioeconomy cluster in Western Macedonia (Greece)

Authors: N. Ntavos (RWM); E. Karampinis, C. Ketikidis and P. Grammelis (CERTH/CPERI)



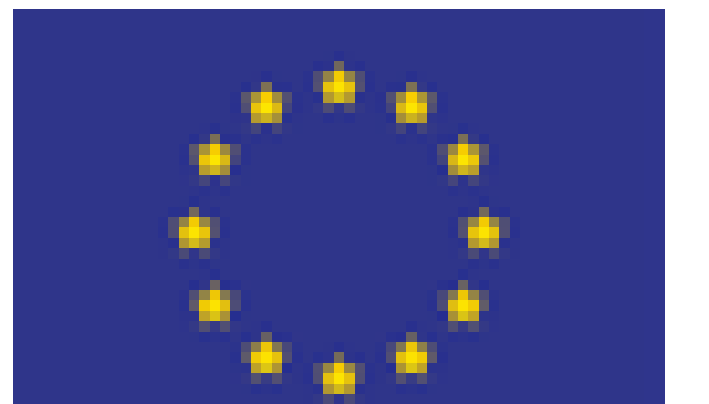
HELLENIC REPUBLIC  
REGION OF WESTERN MACEDONIA  
REGIONAL DEVELOPMENT FUND



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HELLAS



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Process and  
Energy  
Resources  
Institute



## Structure of regional bioeconomy

### Current state of the bioeconomy cluster

#### Start and aim

The bioeconomy cluster Bioenergy and Environment of Western Macedonia (CluBE) was established in 2014 as a non-profit company by 21 Triple Helix members from the public sector, R&D institutes and the private sector. It builds upon an informal collaboration of regional players in projects on bioenergy. The focus of the cluster is on R&D and energy. It is foreseen that in 2016 its members will increase to 40, mainly with the addition of SMEs.

#### Cluster Board

The board of directors of CluBE consists from all three Triple Helix members and the President of the board is the representative of the Regional Authority.

#### Entrepreneurial climate

The cluster mainly aims to mobilise more actors in the wider area and hopes to change the dominating mentality of a lack of cooperation among stakeholders. This little receptive environment arises as:

- the private sector lacks an innovation culture;
- trust and cooperation between business and academia beyond EU/national funded projects is lacking;
- political commitment to the cluster is rather poor;
- relevant legislation is rather incomplete;
- policymakers do not show the will and/or knowledge for pooling different policies;
- mutual collaboration and information regarding supply and demand of biomass resources is missing.

#### Funding

Financing of the activities of CluBE for the first period of operation after its establishment mainly depends on EU project funding and not yet on members' fees, which is foreseen for a later stage.

Cluster initiatives are also expected to be funded regionally under RIS3 strategy and other regional programmes.



### Barriers for the development of the bioeconomy cluster

- lack of active participation of entrepreneurs in the cluster;
- lack of an innovation culture among entrepreneurs;
- lack of cooperation and trust among firms and R&D institutes;
- lack of political commitment;
- difficulties in the supply of biomass resources, such as varying quality and the collection of the supply from a large number of suppliers;
- lack of funding.



Figure 1 Bioeconomy readiness for Western Macedonia compared to Greece

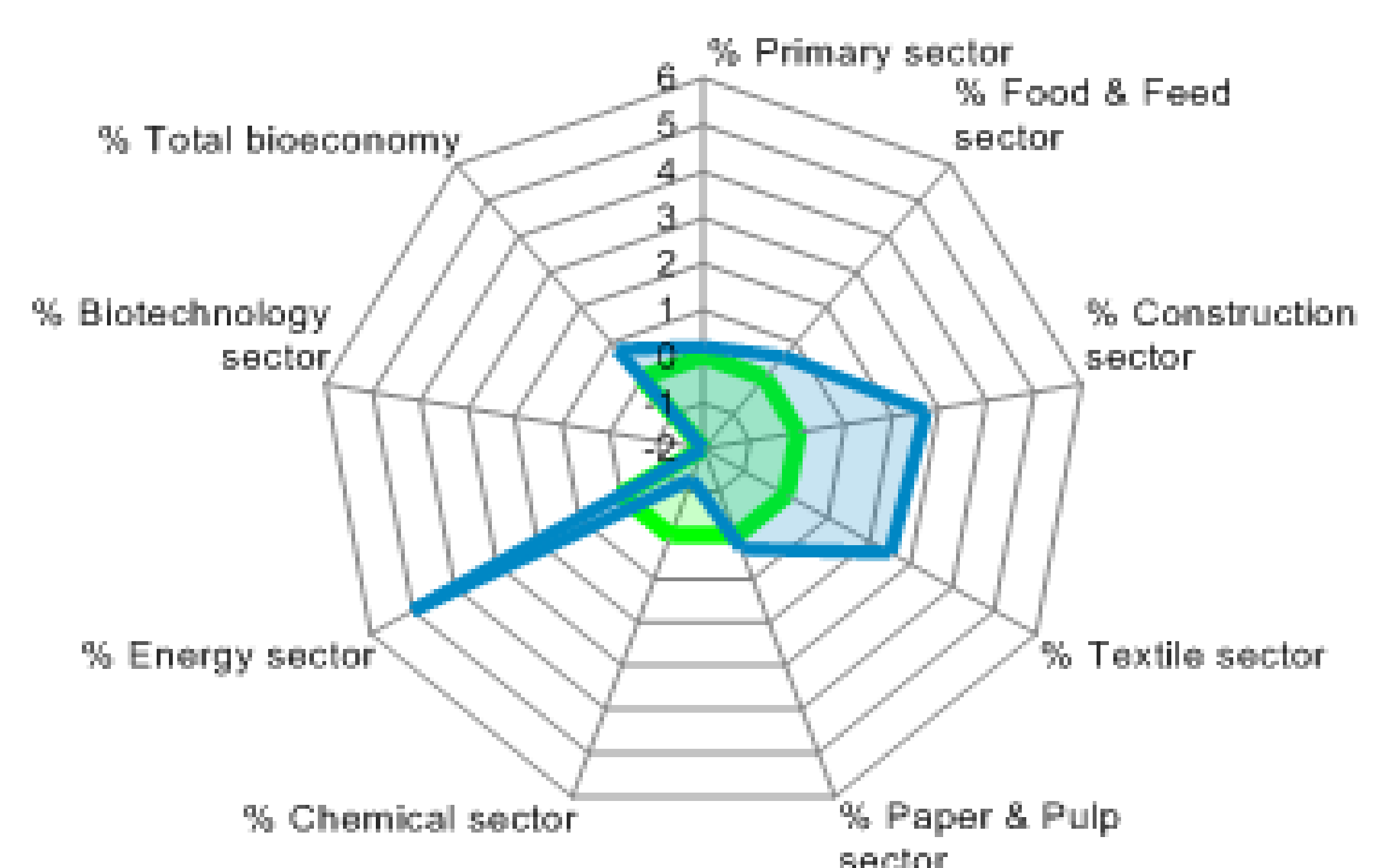


Figure 2 Employment structure (%) in Western Macedonia compared to Greece

### Recommendations for further development of the bioeconomy cluster

#### Concerns

CluBE and the other bioeconomy clusters that might occur in Western Macedonia are and will be launched in a country where actors seem not to have a cluster mentality. However, the Region holds a slightly different mentality and fosters some cooperation initiatives (cooperatives, other clusters, etc.). So for any further development of CluBE, efforts on bridging the gap between science, entrepreneurship and public sector are needed.

#### Recommendations

In case CluBE or other bioeconomy clusters in Western Macedonia might decide to continue with their further development, then it could be recommended to:

- increase the capacity of local actors by learning them to cooperate, to use networks, and to assess their situation in the broader local and global context.



Regional Development Fund of W. M.  
ZEP Area, GR 501 00 Kozani, Greece  
Contact: D. Aslanidou, daslanidou@pta.pdm.gr  
N. Ntavos, ntabosnikos@yahoo.gr  
T + 30 2461053992  
<http://pta.pdm.gr/pdm/>



CERTH/CPERI  
4<sup>th</sup> km. Ptolemais – Mpodosakeio Hospital  
P.O. Box 95, GR 502 00 Ptolemais, Greece  
Contact: E. Karampinis, karampinis@certh.gr  
C. Ketikidis, ketikidis@lignite.gr  
T +30 24630 55300  
<http://www.cperi.certh.gr/>

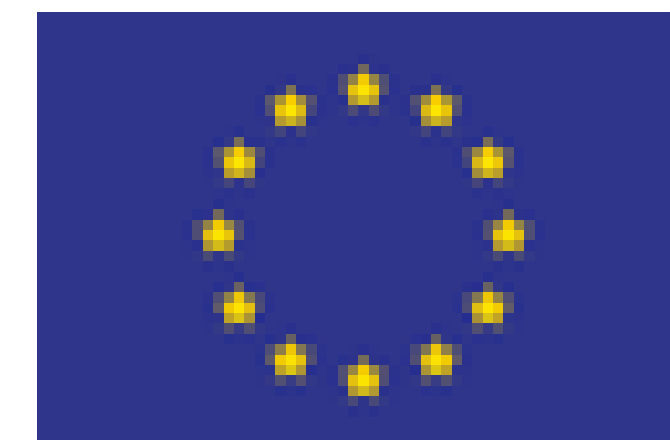


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# 12. Towards a bioeconomy cluster in Osrednjeslovenska (Slovenia)

Authors: Luka Juvančič, Romana Marinšek Logar and Peter Dovč



## Current state of the bioeconomy cluster

### Important to note:

1. Despite its potentials (see bioeconomy readiness wheel, right), the bioeconomy is not (yet) mainstreamed as a policy priority in Slovenia;
2. Although no bioclusters in a strict sense exist in Slovenia, a number of business clusters are operating, not within strict regional boundaries;
3. Osrednjeslovenska is the country's leading region (network of R&D institutions, human resource base, corporate sector), where bioeconomy-related objectives are embedded in regional development priorities.

### Background and aim

The case of the PoliMat Center of Excellence is indicative for discussing the potentials of bioeconomy clusters in Slovenia, both regionally and nationally. CE PoliMat was established in 2009, following a successful bid for EU funding (ERDF). Its mission is to transform research excellence in polymer technology (in particular bio-polymers) into products and services in high-tech niche markets. CE PoliMat gathers the leading national teams from four public research institutions, and sixteen private firms, including the leading firms in the chemicals & polymers sector.

### Management of the Cluster

The management consists of triple helix members (university-industry-government), with a marked leadership of prominent research institutions (NIC and IJS).

### Entrepreneurial climate

A number of active research actors within PoliMat were able to attract attention in R&D circles on world scale with their technology-driven innovations. However, the R&D institutes did not manage to establish a successful cooperation with firms. On the whole, the weak sense of ownership of the corporate cluster members resulted in a limited participation and weak cooperation within the cluster. Moreover, the small scale of most firms and the lack of well-trained human resources hamper the uptake of innovations.

### Funding

The cluster activities were supported almost exclusively from EU project funding. In absence of leverage funding of R&D activities from private sources, spin-off activities of the cluster remained in the inception stage. With the end of EU financing in 2014, the activities of CE PoliMat terminated. The cross-regional networking platform Poly4EMI attempts to extend the scope of cooperation in (bio-)polymer technology between different stakeholders over different regions and value chains.



Photo: www.polimat.si

## Barriers for the development of the bioeconomy cluster

- a weak sense of ownership of the clusters;
- a lack of active participation of entrepreneurs in the cluster;
- a lack of cooperation among firms and R&D institutes: technology-driven innovations among researchers on the one side and lack of an innovation culture among entrepreneurs on the other;
- absence of a long term political commitment towards the development of the bioeconomy clusters;
- absence of long-term and consistent (both public and private) funding arrangements.

## Structure of regional bioeconomy

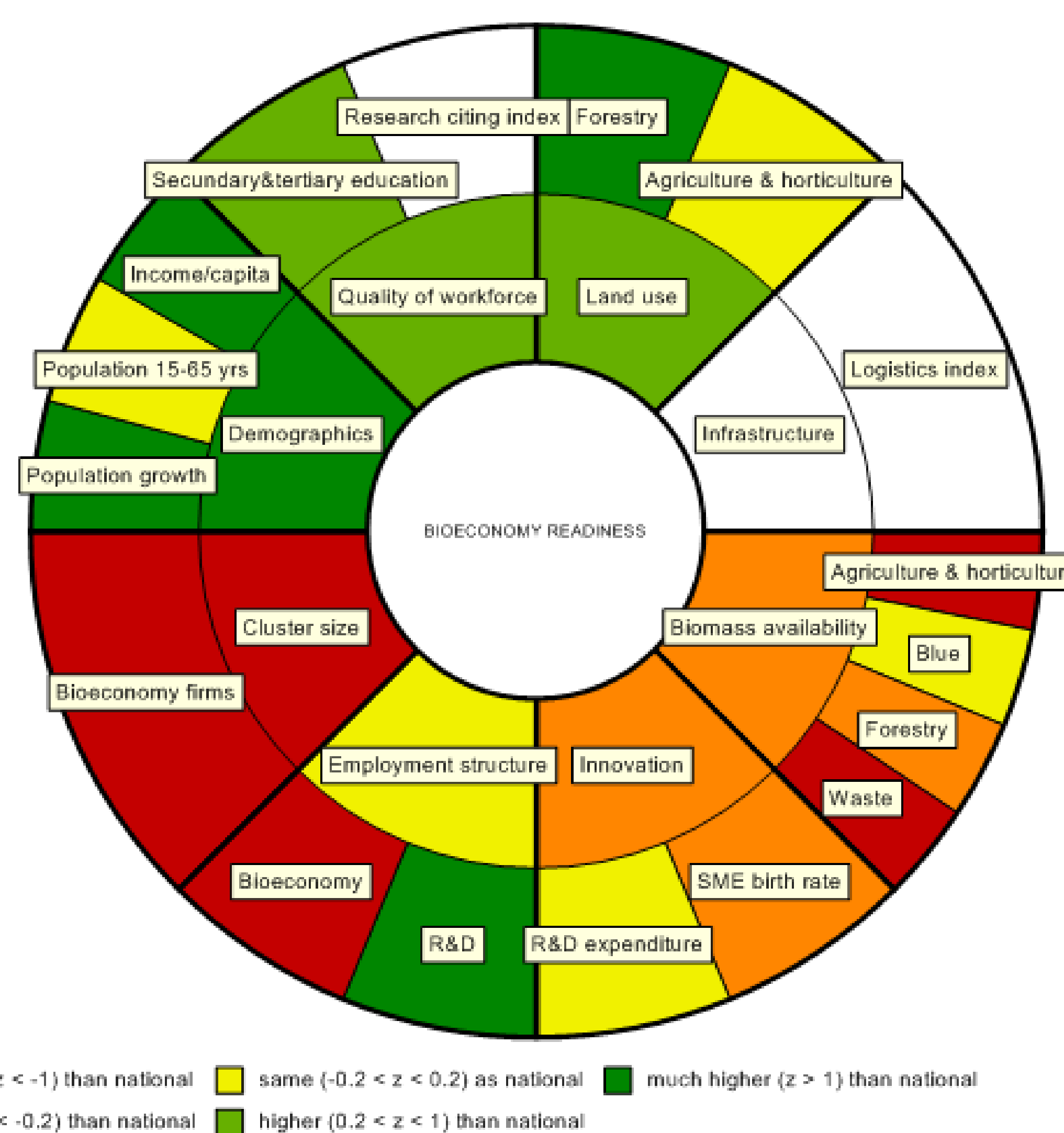


Figure 1 Bioeconomy readiness for Osrednjeslovenska compared to Slovenia

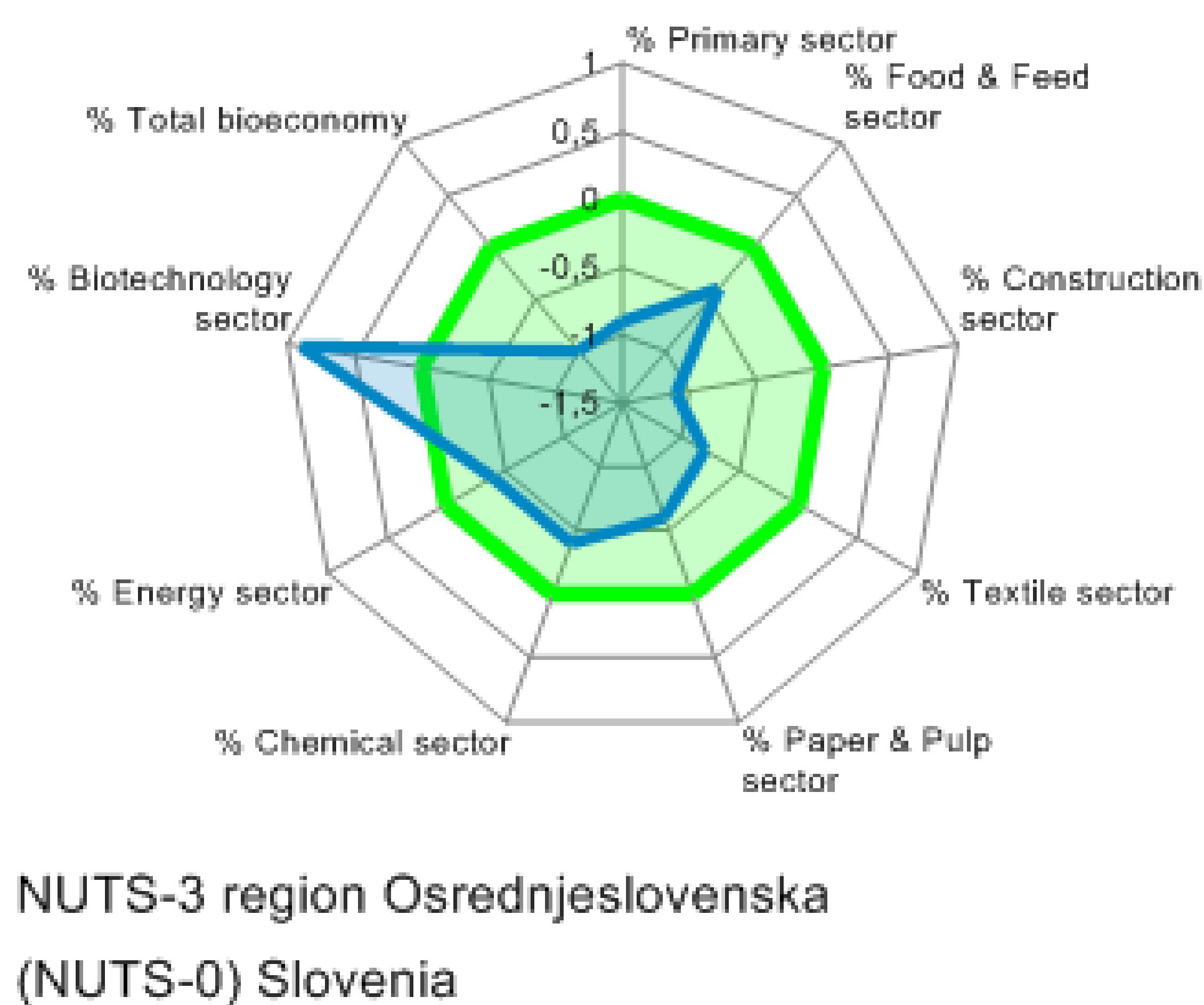


Figure 2 Employment structure (%) in Osrednjeslovenska compared to Slovenia

## Recommendations for further development of the bioeconomy cluster

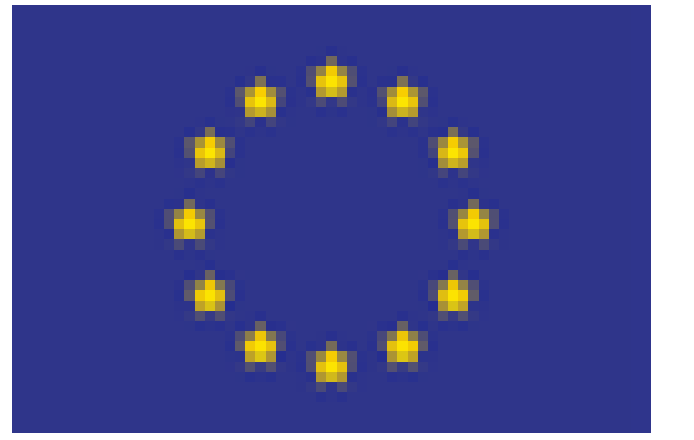
- increase the capacity of local actors by learning them to cooperate, to use networks, and to assess their situation in the broader local and global context;
- use the CE PoliMat results and experience as a base for continuing cluster activities in a broader geographical scope and with institutionally balanced and diversified (particularly private) financial arrangements.





# 13. BERST: recommendations for further research on bioeconomy clusters in EU regions

Author: Myrna van Leeuwen, coordinator BERST team



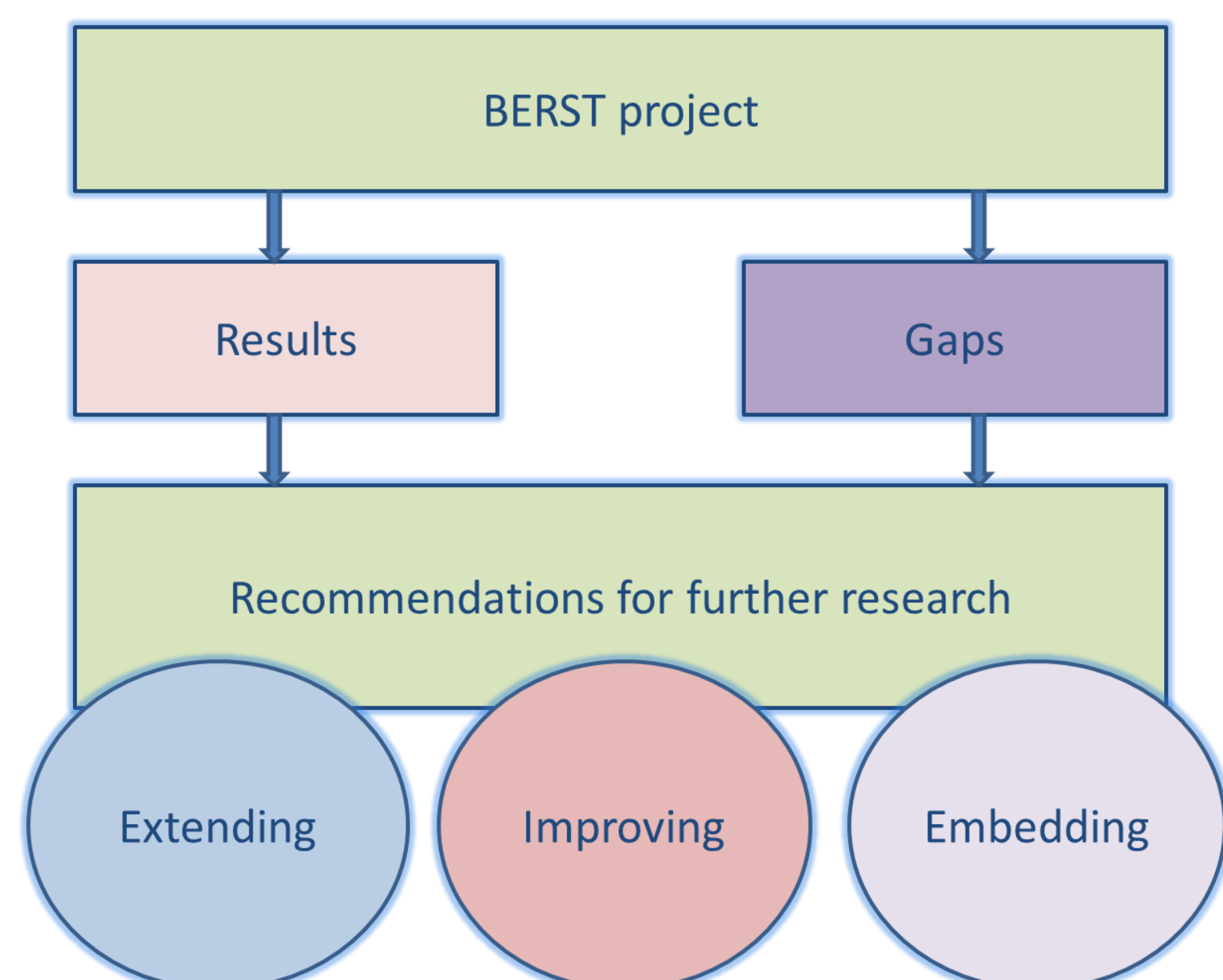
## Main results of BERST ([www.berst.eu/](http://www.berst.eu/))

1. Insight in enabling factors and barriers of bioeconomy clusters in EU regions;
2. Identification and collection of quantitative indicators for analysing the regional bioeconomy in the EU;
3. A Network of Bioregions with approx. 200 members for exploring and sharing experiences on the development of regional bioeconomies in the EU;
4. Recommendations for the further development of the bioeconomy cluster in the seven BERST regions.

## Main gaps identified in BERST

1. Insufficient insight in processes how to remove barriers for a successful development of bioeconomy clusters;
2. Due to lack of data, the number of quantitative indicators to capture the development of the regional bioeconomy in the EU is rather limited, while some other indicators appear to be poor proxies of the bioeconomy.

## BERST recommendations



## 1. Recommendations for further analyses of the development path of bioeconomy clusters

- More in-depth analyses of the development path of the bioeconomy cluster during the various stages, especially of how actors overcome barriers;
- Extension of the research to more Good Practice regions;
- Extension of the research to more EU regions which are in a less mature stage of the development of their bioeconomy cluster.

## BERST team



## 2. Recommendations for improvement of data collection to capture the development of the regional bioeconomy

- Extension of the BERST regional database to more EU regions;
- Collection of data at NUTS3 level for bioeconomy infrastructure and R&D;
- Design of indicators for biomass availability, employment in bioeconomy activities and cluster size, and collection of data for these indicators
- Integration of BERST regional database in BISO database.

## 3. Recommendations for regional strategies to enhance further development of the bioeconomy cluster

- Testing and use of BERST toolkit in more EU regions;
- Design of good practices how to improve the entrepreneurial climate around bioeconomy clusters;
- Follow-up of the meetings of the Network of Bioregions;
- Embedding of the BERST toolkit with BIDO, SCR, ERRIN and CoR platforms;
- Connect BERST results to RIS3 activities.



Name: LEI Wageningen UR  
P.O. Box 29703, 2502 LS The Hague  
Contact: [myrna.vanleeuwen@wur.nl](mailto:myrna.vanleeuwen@wur.nl)  
T + 31 (0)70 33 58 141  
[www.wageningenUR.nl](http://www.wageningenUR.nl)



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