



Cluster Mapping Synthesis Report Eco-Construction

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

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

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CONTENTS

Introduction.....	4
The Cluster Mapping Approach.....	4
Composition of the Eco-Construction Sector.....	6
Overview.....	7
Employment.....	8
Enterprises.....	9
Regional Specialisation.....	12
Summary.....	13
The DanuBioValNet Project.....	13
APPENDIX I.....	15
APPENDIX II.....	17

INTRODUCTION

Eco-friendly or ecological construction (Eco-Construction) is building a structure that is beneficial or non-harmful to the environment and resource efficient. Also known as green building, this type of construction is especially efficient in its use of local and renewable materials (preferably wood-based materials). Also in terms of energy production and consumption, Eco-Construction focuses on obtaining the required energy from green sources.

Eco-friendly construction has developed in response to the knowledge that buildings often have a negative impact upon our environment and our natural resources. This includes transporting materials hundreds or thousands of miles, which increases the energy required for transportation and avoids the emissions of hazardous chemicals from a poorly designed building that creates and traps them.

Multiple options are now available to design and to build an eco-friendly dwelling. Architects, civil engineers and builders worldwide are now using construction techniques that have been developed throughout history, in response to local environmental concerns and the physical resource opportunities available. On top, 21st century technological refinements have been boosting construction techniques essentially.

Buildings that integrate passive energy systems (bioclimatic buildings) are operated using non-mechanical methods, thereby optimizing the use of natural resources. This involves the positioning and location of a building to allow and make use of sunlight throughout the whole year. By using sun rays, thermal mass is stored into the building materials such as concrete, which allows the generation of enough heat for a room.

Eco-friendly building often uses Eco-Materials, which are certified green building materials, such as wood from sustainably managed forest plantations with accreditations from respective certification bodies. Several other types of components and Eco-Materials are often utilized for Eco-friendly buildings. The

commonly usage of recyclable and recycled materials in construction requires that they don't generate any waste during manufacture or after the end of their life cycle. Reclaimed materials such as timber at a construction site or junkyard can be given a second life by reusing them as support beams in a new building or as furniture. Moreover, stones from an excavation can be used in a retaining wall. The reuse of these items does not only decrease the amount of energy that is consumed in making new products, it also achieves a new natural aesthetic quality.

There are further criteria that can be applied for Eco-Construction:

- In terms of significant reduction in heating and cooling requirements, energy gain optimization and power consumption limitation (lighting and ventilation management, efficient equipment).
- In terms of upkeep-maintenance: choice of materials, equipment and implementation requiring limited upkeep, facilitating maintenance and promoting long life for the entire site.
- In terms of overall cost: take into account direct and indirect costs, the increase in energy costs as well as the impact on health and the environment. Only 20 % of the overall cost of a building relates to construction, 80 % is due to its operation (maintenance and consumption)

The market for Eco-Construction, especially wooden houses, is facing strong and rapid growth. There are many reasons for the growing demand, as there are more aspects than just concerns because of ecological issues.

In addition to providing excellent heat and noise insulation, as well as energy savings, wooden-based Eco-Construction houses are prefabricated and modular. This means that costs are reduced and less time is needed for construction and installation, whilst there is a wide variety of styles, configurations and customisations to choose from.

THE CLUSTER MAPPING APPROACH

Clusters can be understood as regional concentrations of economic activities in related industries connected through local linkages and spill-overs, have long been known to be a feature of market economy¹⁾. Cluster organisations can help firms to better engage with other local actors within their cluster and to organise collective actions to strengthen the local context. Moreover, they can reduce the transaction costs for firms, especially SMEs, in building linkages to firms and

collaboration partners in other locations.

Clusters have a distinct geographic dimension, reflecting the dynamics of local spill-overs. They are also deeply embedded in a broader geographic context: they serve markets elsewhere and are connected to other clusters with complementary strengths in regional, interregional or global value chains. This mirrors the role of location for firms: while local conditions provide the unique context for building distinct capabilities and strategic

1) Ketels, Christian (2017), Cluster Mapping as Tool for Development, Harvard Business School, http://www.hbs.edu/faculty/Publication%20Files/Cluster%20Mapping%20as%20a%20Tool%20for%20Development%20_%20report_ISC%20WP%20version%2010-10-17_c46d2cf1-41ed-43c0-bfd8-932957a4ceda.pdf.

positions, national and international linkages are critical to access other markets, suppliers, and collaboration partner.

Cluster mapping describes the process of measuring the presence of cluster actors in a given region across defined sector-specific value chains. Cluster mapping, especially in Emerging Industries like Eco-Construction, is of high relevance to better understand the key competences of the cluster actors as well as to review to what extent the respective value chain is properly covered.

This report provides the first perspective on Eco-Construction clusters across Europe, with dedicated focus on the Danube Region. One key novelty is the introduction of firm-level data to supplement the statistical data from national and EU statistical offices. This firm-based data significantly increases the robustness of the data, especially in countries like Germany that collect regional data through samples rather than reporting by all firms. It also enables performance of individual firms to be tracked over time, gaining more granular insights into patterns of entrepreneurship.

The report is based on a new dataset that is compiled specifically for analysing detailed patterns of cluster evolution. The core of the dataset is the firm- and plant-level data sources from the Orbis Historical dataset supplied by Bureau van Dijk (June 2016 release)². This dataset provides detailed data on the economic performance of firms. It allows the usage of data of firms' turnover, wage bill, capital, materials and employment³, totalling more than 1 billion data points. The coverage is very good in most countries in Europe, and especially for larger limited liability companies. However significant gaps were still present.

In this report **strong clusters** are being determined based on the approach of the European Cluster Panorama, by giving a "Cluster Star" for each region being identified to belong to the top 20 % of European regions in the following dimensions⁴:

- **Specialisation**, measured by the relative size of regional employment in the Eco-Construction

sector reflected in its location quotient (LQ). This relative measure indicates how much stronger a region is in the Eco-Construction sector than it would be expected, given its overall size, compared to the average employment size in the Eco-Construction sector across all regions

- **Absolute size**, measured by the number of employees and establishments. This measure is based on the observation that the number of linkages within a cluster is growing exponentially with the number of participants. Only when economic activity in the Eco-Construction sector moves beyond a threshold of critical mass do cluster effects become significant.

- **Productivity**, measured by the wages paid in an Eco-Construction cluster (adjusted for local cost levels). This measure reflects not only what is being done in a region, but how well it is being done, influenced by the strength of cluster effects. Wages are also influenced by the structure of labour markets and other factors but are strongly correlated with productivity.

- **Dynamism**, measured by a simple average of measures on employment growth and the presence of fast-growing new firms (gazelles). This measure aims to capture whether an Eco-Construction cluster continues to benefit from strong cluster effects in its development or not. The cluster may be hindered in its growth because it has already reached a level where costs or other factors, such as industry-specific growth trends⁴, are greater than the benefits.

The notion of regions is applied in this report by using data for specific administrative regions, generally at the so-called NUTS 2 level. For this report, 232 European regions have been regarded,⁵ each with its own profile and economic performance. These regions are used as a pragmatic choice because they are likely to encompass the "economically relevant" regions; there is data available, and in most cases there is some level of government that can take action for this specific region.

2) European Commission (2016), European Cluster Panorama

3) Employment is usually the only variable available on plant level, the rest are for the firm as a whole.

4) European Commission (2016), European Cluster Panorama

5) The analysis covers all EU-28 countries (comprising 276 NUTS-2 regions) as well as Albania, Bosnia and Herzegovina, Iceland, FYROM, Kosovo (regarding the political status of which no claims are implied), Montenegro, Norway, Serbia, and Switzerland, by applying the NUTS (Nomenclature of Territorial Units for Statistics) standard for the subdivisions of countries for statistical purposes.

METHODOLOGY TO DEFINE THE COMPOSITION OF THE ECO-CONSTRUCTION SECTOR

The operationalisation of the Eco-Construction sector was developed within the DanuBioValNet project by an active involvement of the partners and cluster managers. This became necessary since the composition of this sector was unknown before. In a first step, the characteristic Value Chain for the Eco-Construction sector was been jointly

developed with the partners (Figure 1). The first node can be “cultivation” in case the raw materials can be cultivated. Or, the node can be defined by “collected”, in case the raw material has to be collected in the wild. However, all the following nodes of the Value Chain remain the same.

Figure 1: Value Chain for Eco-Construction (source: DanuBioValNet)

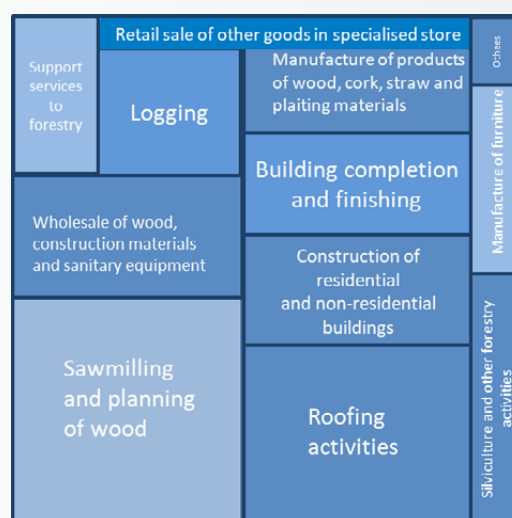


In a next step, all partners and related cluster managers did a detailed mapping of their Eco-Construction cluster initiatives and clusters in their region according to the pre-defined Value Chain⁶. For this purpose the members of the identified cluster initiatives and clusters were grouped by project partners and cluster managers according to the specific nodes of the Eco-Construction Value Chain they operate in. In those cases, where no cluster initiatives existed, key cluster actors were identified and grouped.

In a third step, the specific NACE industry classifications⁷ for all members or cluster actors were

identified as part of the cluster mapping exercises, that allowed to produce a reliable picture Eco-Construction. The Eco-Construction industry composition illustrated in Figure 2 is based on the intensive work of the project partners and related cluster managers and is based on more than 350 companies and their related NACE classifications identified. The size of the different boxes (NACE classifications) is proportional to number of enterprises. As Figure 2 illustrates the biggest share of enterprises (about 21 %) operate in the sector “Sawmilling and planning of wood” (NACE Code C16.10).

Figure 2: Eco-Construction industry composition based on NACE industry classification 2008 (source: DanuBioValNet)



6) Further details of the individual cluster mapping exercises are given in the regional cluster mapping fact sheets available on the DanuBioValNet website (interreg-danube.eu/danubiovalnet)

7) according to NACE Rev. 2 2008; Eurostat – Methodologies and Working Papers (2008), ISSN 1977-0375

OVERVIEW

The Eco-Construction industry in the Danube Region⁸ employs more than 1.2 million workforces and provides 26% of all related jobs in Europe. Furthermore, almost a quarter of all firms operating in this sector are based in the Danube Region (24%). More than 29,000 new jobs have been created by young, high growing companies (by so called Gazelles). Higher dynamics in terms of

increased number of firms compared to all Europe can be found, whereas growth in terms of employment and productivity was lower (Table 1). The basic facts for the Eco-construction sector did not develop as good other sub-sectors of Bio-based Packaging⁹, like e. g. the Phytopharmaceutical sector¹⁰.

Table 1: Basic facts of Eco-Construction industry in the Danube Region compared to Europe

	Danube Region		Europe	
	Level in 2014	Change since 2008	Level in 2014	Change since 2008
Employment	1,274,234	-19.0 %	4,829,730	-11.3 %
Establishments	362,199	17.5 %	1,501,420	7.1 %
Average Wage (EUR)	19,182	-3.7 %	29,829	-4.5 %
Gazelle Employment ¹¹	29,351	-0.3 %	78,890	-1.6 %

Some of the Danube Regions contain strong clusters, since 19 of these regions have at least two or more Cluster Stars (30 % of all Danube Regions).

28 % of all European regions with two or more Cluster Stars are located in the Danube Region.

Table 2: Comparison of Cluster Stars between the Danube Region and Europe (Eco-Construction sector)

Region	No Star	1 Star	2 Stars	3 Stars	4 Stars
Danube	30 (47.6 %)	14 (22.2 %)	12 (19.0 %)	7 (11.1 %)	0
Rest of Europe	135 (58.2 %)	49 (21.1 %)	26 (11.2 %)	18 (7.8 %)	4 (1.7 %)

Figure 3 profiles all European regions according to the Cluster Stars in the Eco-Construction industry. Most strong regions are located in the north and east of Europe with high concentrations in Finland, Sweden and the Baltic Region as well as in Poland, Bulgaria and Romania. Also, there are some

above-average regions in Spain and Portugal. The strongest ones, holding the maximum of 4 Stars, are located in Finland and Latvia. According to Figure 3, especially Finland can be determined as a major player in terms of Eco-Construction industries.

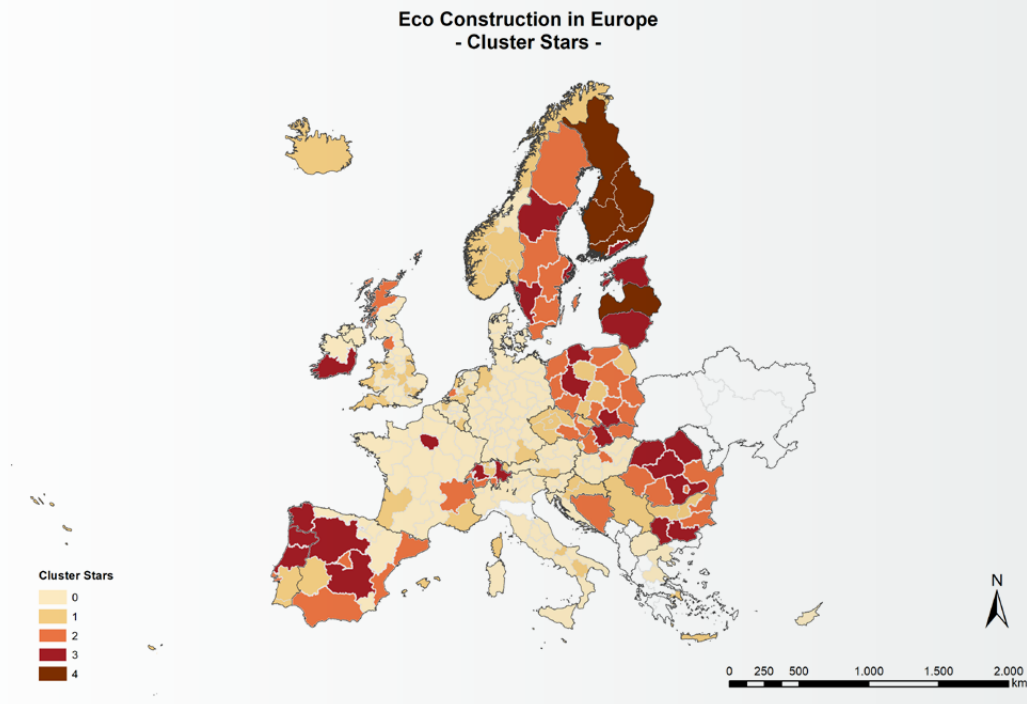
8) 63 Member Regions with data; no data available for Ukraine (4 NUTS-2-Regions) and Moldavia (1 NUTS-2-Region)

9) Meier zu Köcker, Gerd; Sedlmayr, Benedikt and Neugebauer, Kim (2017): Cluster Mapping Synthesis Report on BioBased Packaging, <http://www.interreg-danube.eu/approved-projects/danubiovalnet/outputs>

10) Meier zu Köcker, Gerd and Dermastia, Mateja (2017): Cluster Mapping Synthesis Report on the Phytopharmaceutical Sector, <http://www.interreg-danube.eu/approved-projects/danubiovalnet/outputs>

11) No data available for 12 of 295 European regions

Figure 3. European top regions in Eco-Construction (Cluster Stars, 2014)



EMPLOYMENT

Figure 4 illustrates the employment pattern in the Eco-Construction Sector in Europe. This pattern shows several regions all over Europe employing more than 50,000 workforces. The five regions Lithuania, Andalusia, Mazowieckie, Norte and Slaskie together employ 8.4 % of all European

workforces in the Eco-Construction sector. Four Danube Regions belong to the top 15 regions, including Bosnia and Herzegovina as well as Central, North-West and North-East Region (all Romania) (s. Table 3).

Figure 4: Leading European regions in Eco-Construction (Full Time Equivalents, 2014)

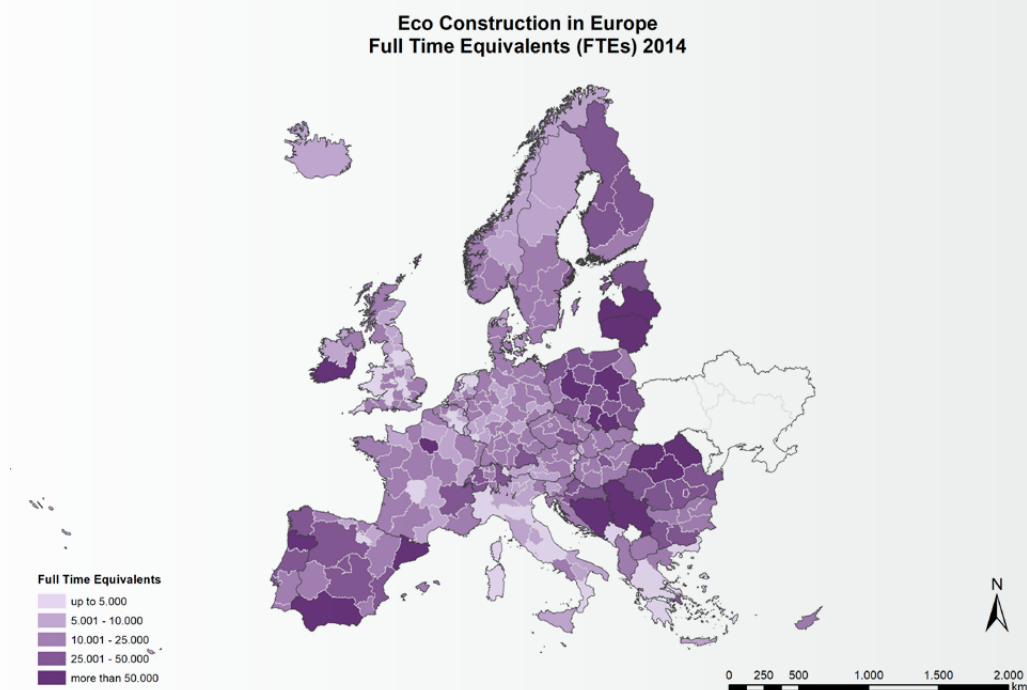


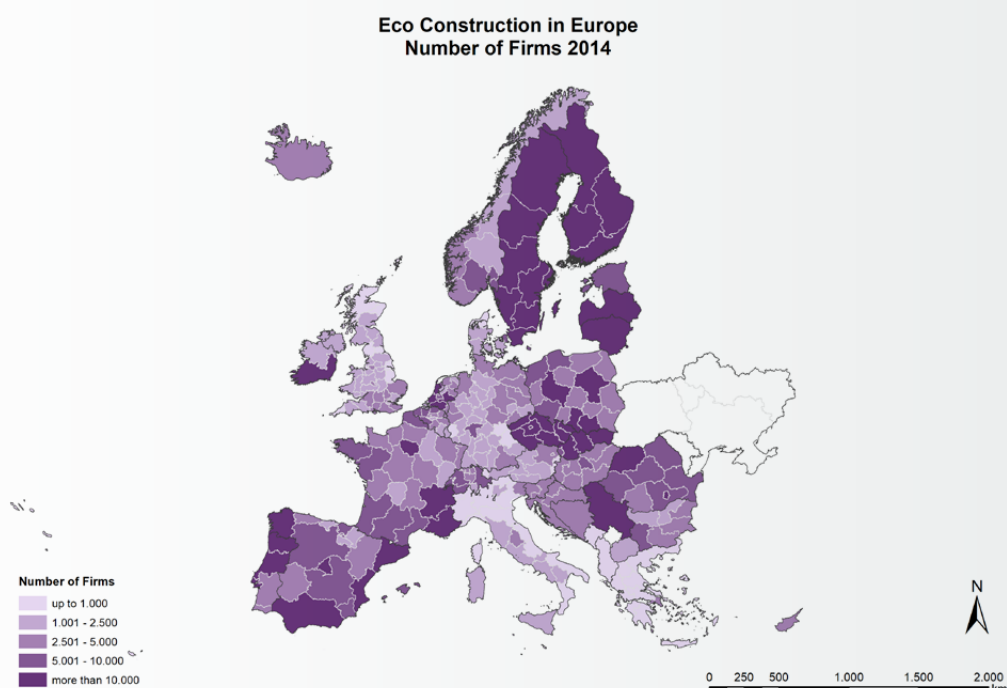
Table 3: Top 15 European regions with highest number of employment in the Eco-Construction sector (Full Time Equivalents, 2014)

NUTS	Region	Employment (FTE)	NUTS	Region	Employment (FTE)
LT00	Lietuva	91,857	FR10	Île de France	65,124
ES61	Andalucía	86,764	PL21	Malopolskie	61,272
PL12	Mazowieckie	80,534	LV00	Latvija	60,917
PT11	Norte	73,683	RS11/12/21/22	Serbia	60,494 ¹²
PL22	Slaskie	73,359	IE02	Southern and Eastern	59,164
RO21	Nord-Est	70,946	RO12	Centru	58,621
BA00	Bosnia and Herzegovina	69,264	PL41	Wielkopolskie	56,461
ES51	Cataluña	67,019			

ENTERPRISES

The pattern, depicted in Figure 5, shows that the number of enterprises in the Eco-Construction sector is especially high in countries like the Czech Republic, Finland, France, Latvia, Lithuania, Serbia and Spain. The Czech Republic, part of

the Danube Region, is home to nearly 9 % of all Eco-Construction enterprises in Europe and accounts for a share of 37 % of all respective firms operating in the Danube Region.

Figure 5: Leading European regions in Eco-Construction (Enterprises, 2014)

12) Due to statistical reasons, all four regions of Serbia are grouped together

Table 4 illustrates the top European regions in terms of the corresponding number of operating enterprises in Eco-Construction industries. Only

three regions from Danube Region (all from the Czech Republic) can be identified among the top 15 regions.

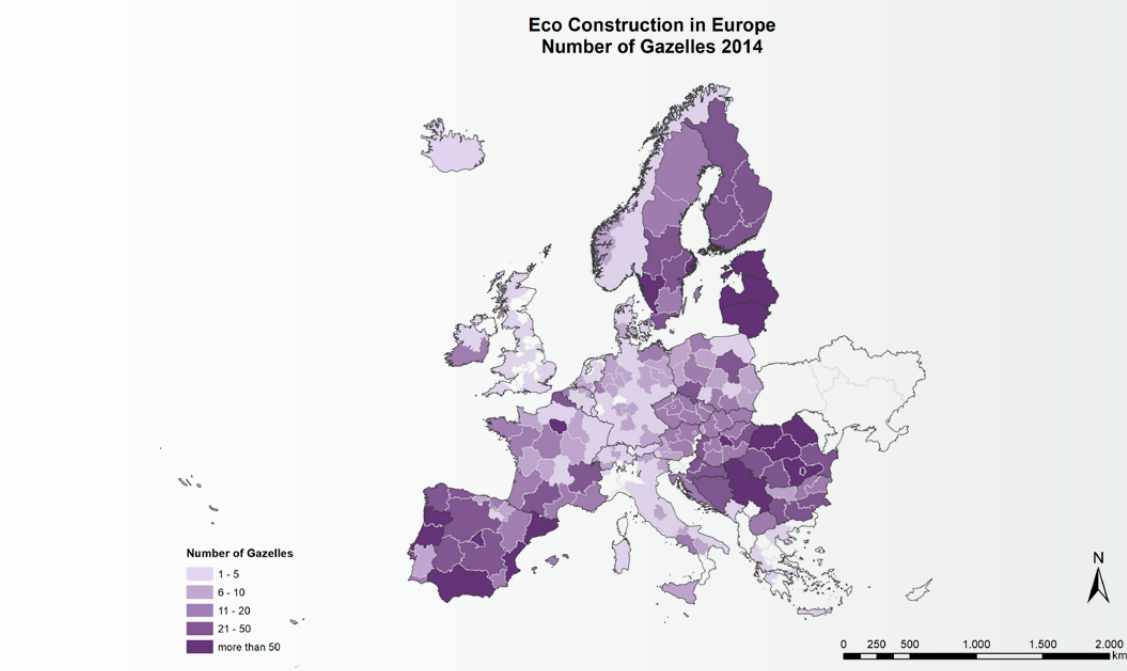
Table 4: Top 15 European regions according to number of enterprises in Eco-Construction (Enterprises, 2014)

NUTS	Region	Enterprises	NUTS	Region	Enterprises
ES51	Cataluña	32,770	SE11	Stockholm	22,739
FR10	Île de France	32,247	CZ05	Severovýchod	20,476
ES61	Andalucía	26,965	ES52	Valencia	20,186
SE23	Västsverige	26,407	SE33	Övre Norrland	19,261
SE31	Norra Mellansverige	26,120	NL33	Zuid-Holland	19,077
SE21	Småland med öarna	24,444	SE12	Östra Mellansverige	18,716
ES30	Madrid	23,927	CZ02	Stredni Cechy	18,641
CZ06	Jihovýchod	23,122			

Firm-level data has been used to also identify so-called "Gazelles"¹³. Due to the novelty of this data source and differences in coverage across countries, the results have to be interpreted with caution. In particular, it seems likely that country-specific rules and regulations, for example on taxation, have an important influence on the presence of new business formation that is not directly linked to the overall dynamism of the economy. However, the reader might consider these data to be interesting¹⁴.

When taking a closer look at the European map (s. Figure 6), three most dynamic Macro regions related to young high growth enterprises (Gazelles) can be found; Namely South-West Europe (South-west France, Portugal and Spain) and the Baltic Sea Region as well as the Danube Region. The latter one hosts more than 1250 Gazelles (26.670 Gazelles employment), whereas South-West-Europe counts 1030 Gazelles (17.800 Gazelles employment) and the Baltic Sea Region comprises around 850 Gazelles (13.800 Gazelles employment).

Figure 6: Leading European regions in Eco-Construction (Gazelles, 2014)¹⁵



13) Here, Gazelles are defined as companies that are less than 5 years old have grown their employment at least 10 % annually over a period of three years

14) European Commission, European Cluster Panorama 2016

15) No data for Gazelles available for Albania, Slovenia, Kosovo as well as for some Italian regions (Calabria, Liguria, Lombardia, Piemonte)

Especially strong individual regions can be identified in the three Baltic States, France, Hungary, Portugal, Serbia, Sweden, Spain and Romania. Gazelles in Latvia and Lithuania both employ the largest quantity of workers (more than 3.000 each). Regions like Andalusia or Lithuania are,

again, listed in the top 5 regions (Table 5). Notably, five out of seven Danube Regions that are among the top 15 are located in Romania. Thus, the overall number of Romanian Gazelles accounts for a share of 41.4 % of all Gazelles from the Eco-Construction sector in the Danube Region.

Table 5: Top 15 European regions with highest number of enterprises operating in the Eco-Construction sector (Gazelles, 2014)

NUTS	Region	Enterprises	NUTS	Region	Enterprises
LT00	Lietuva	181	FR10	Île de France	71
ES61	Andalucía	136	SE11	Stockholm	70
LV00	Latvija	136	ES51	Cataluña	68
RO21	Nord-Est	129	RO32	Bucuresti - Ilfov	67
PT11	Norte	110	RO11	Nord-Vest	66
RO31	Sud - Muntenia	85	ES30	Madrid	65
RO12	Centru	73	HU10	Kozep-Magyarország	64
RS11/12/21/22	Serbia	73 ¹⁶			

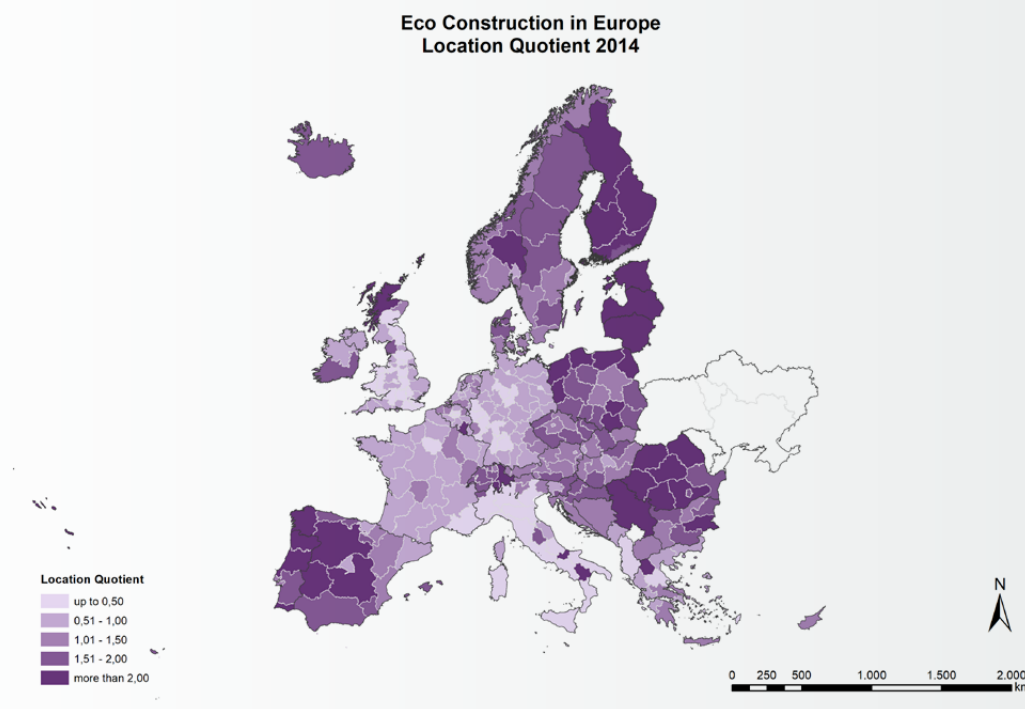
16) Due to statistical reasons, all four regions of Serbia are grouped together

REGIONAL SPECIALISATION

Measuring regional specialisation of the Eco-Construction industry can provide interesting insights to what extent a region is stronger than would be expected in this sector given its overall size, compared to the average employment size in the Eco-Construction sector across all regions. Regional Specialisation can be measured by the Location Quotient (LQ). Figure 7 shows to what

extent European regions are specialised in the Eco-Construction industry. Again, Spain, the Baltic Sea Region as well as the Danube Region reveal a remarkable concentration of highly specialised regions with LQ values above 1.5. 48 out of 63 Danube Regions reveal LQ values over 1¹⁷, with Serbia, Romania and Bosnia-Herzegovina holding the leading positions within Danube Region.

Figure 7: Leading European regions in Eco-construction industry (Specialisation, 2014)



The top 15 European regions in terms of specialisation are mainly located in the three Baltic States, Bosnia and Herzegovina, Finland, Italy, Northern

Poland, Portugal, Romania, Serbia, and Spain (Table 6). The latter one is the only Swiss region that ranks among any top 15 list given in this report.

Table 6: Top European regions with highest level of Specialisation in the Eco-Construction sector (Location Quotient, 2014)

NUTS	Region	Enterprises	NUTS	Region	Enterprises
FI20	Åland	3.72	ITF2	Molise	2.84
FI1D	Northern and Eastern Finland	3.71	NO02	Hedmark og Oppland	2.82
RO21	Nord-Est	3.19	PL62	Warminsko-Mazurskie	2.80
ES63	Ceuta	3.02	RO12	Centru	2.75
PT20	Açores	2.91	ES43	Extremadura	2.64
LT00	Lietuva	2.89	EE00	Eesti	2.60
BA00	Bosnia and Herzegovina	2.87	FI19	Western Finland	2.59
ES42	Castilla-La Mancha	2.86			

17) Value higher than 1.0 mean a given region is higher specialized than the European average

SUMMARY

The Eco-construction sector in the Danube Region employs more than 1.2 million workers. The findings of the previous chapters illustrate that this region belongs, besides the Baltic and the South-western European region (South-west France, Portugal and Spain), to the front-runners in the Eco-construction sector. Especially regions in Romania and Serbia, but also in Bosnia and Herzegovina and Bulgaria, show strong economic data in different categories.

More than 1250 high growth enterprises (Gazelles) are located in the Danube Region.

Table 7 (s. Appendix) provides more information about the strongest regions in this sector. There are many cluster initiatives in the field of Eco-Construction, many of them well established and have a good critical mass. In Appendix II the most relevant cluster initiatives are listed.

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 eco-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 joint 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 clusters and SMEs will benefit from the new innovative tools and methods developed for transnational cross-clustering. Successfully established new bio-based value chains in the pilot actions

can motivate other clusters and SMEs to test this newly developed approach in the future.

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	CA BW	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	MEC	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

APPENDIX I

European top regions in Eco-Construction Industry (at least 2 Cluster Stars , 2014)

NUTS	Region	Cluster Stars	Firms	Employment (FTE)	LQ	Avg. Wage	Gazelles	Gazelle FTE
FI19	Western Finland	4	16,654	35,308	2.59	27,798	30	335
FI1C	Southern Finland	4	12,322	24,486	2.14	29,503	29	347
FI1D	Northern and Eastern Finland	4	16,164	49,877	3.71	27,886	45	631
LV00	Latvija	4	11,731	60,917	2.55	16,592	136	3,187
BG41	Yugozapaden	3	7,789	37,964	1.28	8,859	40	1,010
BG42	Yuzhen tsentralen	3	4,151	26,009	1.93	4,377	33	672
CH02	Espace Mittelland	3	6,726	32,192	1.82	44,196	4	203
CH05	Ostschweiz	3	5,525	26,951	2.17	44,317	5	103
EE00	Eesti	3	8,131	36,839	2.60	18,963	55	878
ES11	Galicia	3	13,419	41,874	2.14	22,647	44	1,163
ES41	Castilla y León	3	8,722	35,098	2.11	24,585	42	546
ES42	Castilla-La Mancha	3	8,773	35,042	2.86	22,613	40	635
FI1B	Helsinki-Uusimaa	3	13,025	24,543	1.62	33,504	29	722
FR10	Île de France	3	32,247	65,124	0.49	43,157	71	872
IE02	Southern and Eastern	3	18,254	59,164	1.50	32,432	17	1926
LT00	Lietuva	3	17,220	91,857	2.90	11,295	181	4,165
PL21	Malopolskie	3	12,652	61,272	2.20	10,563	17	360
PL41	Wielkopolskie	3	10,974	56,461	1.91	12,504	14	701
PL63	Pomorskie	3	7,878	41,629	2.15	11,530	12	178
PT11	Norte	3	18,550	73,683	2.24	14,002	110	2,064
PT16	Centro	3	12,674	45,116	2.28	12,666	63	884
RO11	Nord-Vest	3	10,887	52,011	2.35	7,565	66	1,741
RO12	Centru	3	9,208	58,621	2.75	8,732	73	1,410
RO21	Nord-Est	3	9,241	70,946	3.19	6,176	129	3,521
RO31	Sud - Muntenia	3	7,266	47,599	2.27	6,092	85	2,314
SE11	Stockholm	3	22,739	25,363	0.93	45,684	70	1,170
SE23	Västsverige	3	26,407	24,374	1.14	38,809	61	*
SE32	Mellersta Norrland	3	13,475	7,639	1.94	30,154	16	*
SK03	Stredne Slovensko	3	15,982	20,999	1.86	17,173	12	147
BA00	Bosnia and Herzegovina	2	4,581	69,264	2.87	5,700	23	1,052
BG33	Severoiztochen	2	2,980	16,977	1.79	5,702	18	329
BG34	Yugoiztochen	2	3,315	21,246	2.07	5,967	25	819
CH01	Région lémanique	2	6,597	28,131	1.66	56,795	6	90
CH07	Ticino	2	2,115	11,663	2.53	62,163	*	*
CZ06	Jihovýchod	2	23,122	29,132	1.75	15,149	18	319
CZ07	Stredni Morava	2	16,965	20,217	1.78	12,395	15	165

* No data available

NUTS	Region	Cluster Stars	Firms	Employment (FTE)	LQ	Avg. Wage	Gazelles	Gazelle FTE
ES30	Madrid	2	23,927	49,972	0.69	27,794	65	1,147
ES51	Cataluña	2	32,770	67,019	0.93	28,940	68	1,107
ES52	Valencia	2	20,186	48,220	1.30	26,423	51	1,082
ES61	Andalucía	2	26,965	86,764	1.64	26,015	136	2,302
FI20	Åland	2	415	3,872	3.72	27,522	3	31
FR71	Rhône-Alpes	2	12,964	31,729	0.65	39,159	24	498
HU10	Közép-Magyarország	2	9,341	27,992	0.65	7,603	64	1,431
NL33	Zuid-Holland	2	19,077	24,844	0.88	37,396	8	171
PL12	Mazowieckie	2	13,703	80,534	1.46	15,512	40	421
PL22	Śląskie	2	11,331	73,359	1.55	12,740	12	152
PL31	Lubelskie	2	4,118	34,251	1.88	9,197	7	274
PL32	Podkarpackie	2	4,259	33,484	1.99	11,057	7	314
PL33	Świętokrzyskie	2	2,941	29,064	2.54	7,676	4	53
PL42	Zachodniopomorskie	2	5,784	32,871	2.26	10,825	7	160
PL43	Lubuskie	2	3,061	24,553	2.36	9,202	6	235
PL51	Dolnośląskie	2	9,499	44,880	1.67	9,987	22	220
PL62	Warmińsko-Mazurskie	2	3,785	37,210	2.80	9,287	3	40
PT17	Lisboa	2	13,983	41,300	1.25	15,363	42	1,269
RO22	Sud-Est	2	6,727	37,237	1.91	8,806	42	856
RO32	București - Ilfov	2	10,123	46,452	1.53	12,431	67	1,494
RO41	Sud-Vest Oltenia	2	3,258	29,017	2.22	9,679	33	889
RO42	Vest	2	6,472	36,582	2.02	8,864	43	1,008
SE12	Östra Mellansverige	2	18,716	17,996	1.07	36,621	32	*
SE21	Småland med öarna	2	24,444	16,114	1.77	34,916	18	*
SE22	Sydsverige	2	15,090	17,118	1.15	35,815	38	672
SE31	Norra Mellansverige	2	26,120	15,660	1.85	35,375	28	*
SE33	Övre Norrland	2	19,261	9,566	1.65	37,363	13	*
SK02	Zapadne Slovensko	2	13,139	19,701	1.22	15,893	12	144
SK04	Východne Slovensko	2	15,023	16,116	1.37	17,305	11	117
UKD1	Cumbria	2	624	9,546	1.86	30,855	1	21
UKM6	Highlands and Islands	2	556	10,671	2.35	19,097	1	26

* No data available

APPENDIX II

Selected cluster initiatives in the Eco-Construction Sector

Name	Country	Number of cluster actors	Established
Furniture & Wood Cluster Upper Austria	Austria	245	2000
Wood Cluster Steiermark	Austria	150	2001
Wood Cluster Salzburg/Pro Holz Salzburg	Austria	N. A.	2004
The Wood Cluster Slavonian Oak	Croatia	31	2010
Croatian Competitiveness Cluster for Wood Processing	Croatia	78	2013
Croatian Wood Cluster	Croatia	77	2013
Wood Chain Black Forest	Germany	200	
Wood Industry Cluster Slovenia	Slovenia	100	1999
SRIP Smart Building	Slovenia	n. a.	2017
Moravian Wood Cluster	Czech Republic	12	2010
National Wood Cluster	Czech Republic	22	2005
Czech Furniture Manufacturers	Czech Republic	29	2006
PRO WOOD	Romania	46	2010
Construct Cluster Oltenia	Romania	36	2013
Constructors Guild Iasi	Romania	26	2013
Timber Cluster	Serbia	19	2010
Hemp Cluster	Slovakia	32	2015

The Cluster Mapping Synthesis Report was prepared by:
 Dr. Gerd Meier zu Köcker (ClusterAgentur Baden-Württemberg)
 Benedikt Sedlmayr (VDI/VDE-IT)

ClusterAgentur Baden-Württemberg im Haus der Wirtschaft

Willi-Bleicher-Straße 19
 70174 Stuttgart, Germany
www.clusterportal-bw.de
www.vdivde-it.de

www.interreg-danube.eu/approved-projects/danubiovalnet