

WP T1.2 A2 – Cluster mapping

Deliverable D.T1.2.1 – Cluster mapping report synthesis

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List of abbreviations

ERDF	European Regional Development Fund
EU	European Union
LP	Lead Partner
PP	Project Partner
R&D	Research and Development
VC	Value Chain
WP	Work package

Introduction

About the AlpLinkBioEco project

The AlpLinkBioEco project addresses one of the biggest common challenges of the Alpine Space: the transition from a fossil-based to a circular bio-based economy. This transition is needed to strengthen the regional economic activity and sustain high value-added businesses and jobs in the Alpine Space. The challenges mainly arise because of the traditional way of operating in a linear economy where by-products necessarily end up as waste and where alternative, circular end-of-life solutions remain unexploited. In addition, there is a lack of understanding of the Alpine Space's natural resources as alternative, bio-based inputs. The alpine regions possess huge biomass resources as well as the necessary knowledge and technology to use them in sectors such as green chemicals, biopolymers or bio-based materials. In a globalized economy, interregional opportunities and solutions based on locally available resources often remain untapped. Due to a missing holistic transnational approach, the Alpine Space actors in bio-based industries operate in a relatively disconnected mode. Important value chains are not established; especially for producing high-value applications that address critical societal needs such as economic durability, local employment and quality of life.

The project is designed to tap into the existing potential by setting up a methodology to connect diverse bio-feedstock producers with intermediate product developers and end users of high value applications which address critical societal needs. The purpose is to create new cross-regional value chains for a bio-based circular economy. Four sectors are targeted as a basis for the creation of such value chains. The agro and wood industries are both related to the feedstock supply. Chemicals and packaging are related to products that can be made from these feedstocks. The project is expected to result in four demonstrator value chains with identified individual actors. These demonstrators are examples of how a circular bio-based economy can work in the Alpine Space by connecting real actors across the participating regions into functioning new value chains. At the policy level, the examples will contribute to the development of a cross-regional and coherent circular bio-based economy strategy.

AlpLinkBioEco project partners

Role	Project partner	Acronym	Country/Region
Non-ERDF LP	Plastics Innovation Competence Center PICC	PICC	Switzerland
ERDF PP2	Business Upper Austria Biz-Up	Biz-Up	Upper Austria
ERDF PP4	Poly4Eml hosted by Anteja ECG d.o.o.	Poly4Eml	Slovenia
ERDF PP5	Centro Studi Alpino Pieve Tesino	CSALP	Trentino-Alto Adige
ERDF PP6	Confindustria Lombardia	CFL	Lombardy
ERDF PP7	BIOPRO Baden-Württemberg GmbH	BIOPRO	Baden-Württemberg
ERDF PP8	Trentino Innovation Hub	HIT	Trentino-Alto Adige
ERDF PP9	Technology Center Horb	TZH	Baden-Württemberg
ERDF PP10	Lombardy Green Chemistry Association	LGCA	Lombardy
ERDF PP11	Plastipolis	Plastipolis	Auvergne-Rhône-Alpes
ERDF PP12	France Clusters	CDIF	Auvergne-Rhône-Alpes
ERDF PP13	Ministry of Education, Science and Sport	MIZS	Slovenia
ERDF PP14	Chemistry Cluster Bavaria	CCB	Bavaria
ERDF PP15	Fraunhofer Italia	FHN	Trentino-Alto Adige

Nature of the report

The synthesis of cluster mapping by the AlpLinkBioEco project partners is the second deliverable in WP T1.2 - D.T1.2.1.1. This Cluster mapping report is the first cluster report prepared through automatized collection of data at the cluster and value chain level. The report follows the guidelines stipulated in the Cluster mapping methodology adopted in May 2019 which provided detailed methodology and expanded upon the discussion among PPs on usage of interface as a collection tool. This report also considers the feedback received during a discussion with PPs as part of the PSG4 meeting in Linz on October 30, 2019 as well as comments from PPs and advisory board members regarding the draft report.

Objective and scope

Objective. The Cluster Mapping Synthesis report integrates eight regional cluster mapping reports from fourteen PPs of the AlpLinkBioEco project. The report serves as an overview of the maturity of the bio-based value chains in terms of activities and actors engaged in selected value chains. The cluster mapping provides value added to the AlpLinkBioEco partnership by providing the partnership with data collected through interface and by identifying missing links in terms of gaps and constraints along the regional value chains. It further helps to identify potential synergies that can be exploited by effective cross-regional collaboration. Importantly, the approach to cluster mapping by using interface provides a useful base for further development of a digital tool for collection of useful data on value chains based on clusters and analysis.

The synthesis provided in this report specifically provides an overview of identified relevant clusters and cluster initiatives in the context of AlpLinkBioEco. The specific focus is on value chains in the areas of wood, agriculture, food/pharmaceutical packaging and chemistry. The cluster mapping report is based on selected clusters active in bio-based industry. These are provided by PPs and do not necessarily assess the importance of bio-based value chains for a given region¹.

Methodology and operational aspects

The synthesis cluster mapping report serves to integrate eight regional cluster mapping reports from fourteen PPs and summarized datasets from the web interface². Additionally, the workshop organised in Zürich served to identify gaps, constraints, missing links/actors, synergies and opportunities of predefined value chains. It also includes discussion of the draft cluster mapping synthesis report from the PSG 4 meeting in Linz.

The report highlights opportunities and potential cross-regional synergies for predefined value chains. Six value chains were defined based on the clusters included in the PPs regions. In addition, two value chains were selected as representative of the AlpLinkBioEco partnership (e.g. pharma, fragrance and cosmetics and energy). Some of the value chains are important for individual regions, like packaging machinery (Baden-Württemberg), and beer brewing, chipping process (Upper Austria). These are not part of this analysis. However, data on actors are included in the web interface database and can be further used within the project.

¹ Numerous projects assess the importance of the bio-based industry. The AlpLinkBioEco project instead focuses on value generation in the bio-based industry.

² The eight regional cluster mapping reports are based on methodological guidelines for cluster mapping - AlpLinkBioEco - T1 A2 Cluster mapping methodological guidelines, May 2019.

This synthesis report includes information relevant to the identification of firms to be included in the database of AlpLinkBioEco (knowledge base A.T.1.3). The report also serves to inform the A.T.3.1 demonstration of VCs by helping to implement pilot actions.

The rest of the report is organized as follows: The next section presents an overview of the innovative data collection approach and selected value chains based on clusters included in the web interface database in April 2019. Chapter 1 provides a description of clusters and cluster initiatives. Chapter 2 provides figures and findings on mapped clusters along predefined value chains. The next chapter is focused on missing links along the selected value chains. The last chapter describes opportunities, future perspectives and potential cross-regional synergies along selected value chains.

The last part of the report provides the annexes. ANNEX I: List of clusters/cluster initiatives mapped by project partners and, ANNEX II: Clusters/cluster initiatives in predefined value chains.

Data collection approach

Cluster mapping (by definition) is the mapping of existing actors and current linkages. It allows for the identification of gaps, synergies and opportunities. Methodological guidelines for cluster mapping, prepared by WP lead PP4, enable each PP to analyse clusters in their own respective regions. Furthermore, cluster mapping methodology enables the PPs to analyse clusters in their own region or neighbouring ones (e.g. Piedmont, Lombardy, Liguria, Sud Provence Alps Côte d'Azur). It provides effective methods for PPs to gain necessary insight into regional bio-based clusters.

The PPs conducted desk research, online surveys and in-depth interviews with cluster managers/CI members/actors. The mapping of clusters or cluster initiatives and actors was done through web interface: <https://alplinkbioeco.tic.heia-fr.ch>.

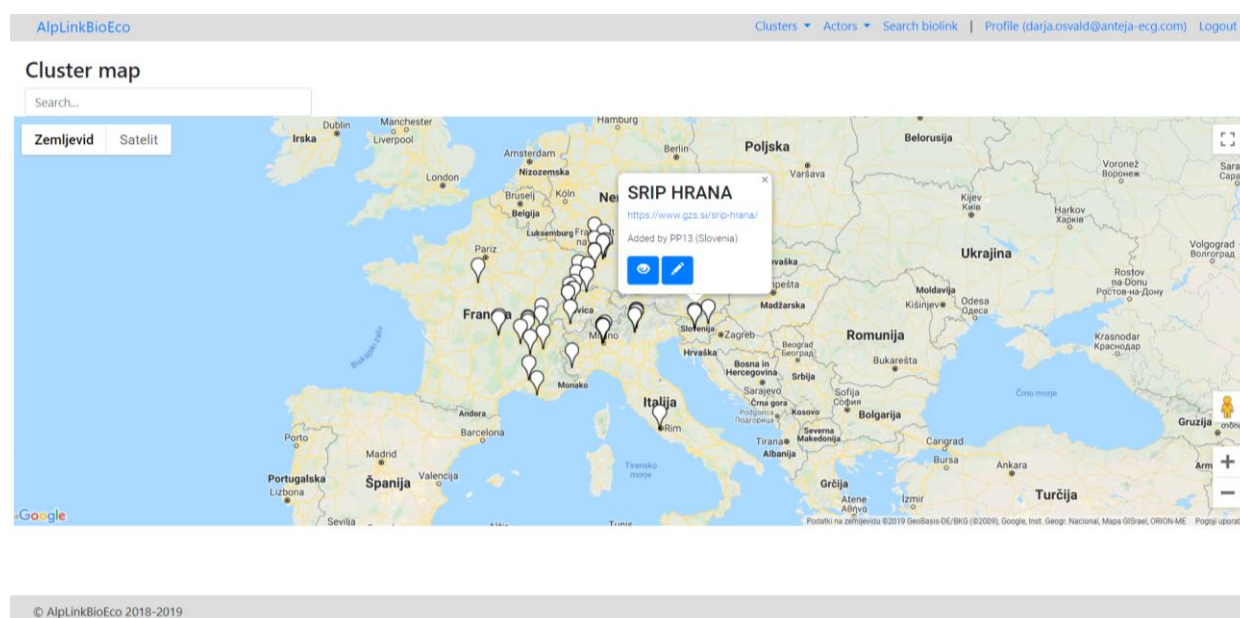


Figure 1: A screenshot of the cluster map with information developed by the AlpLinkBioEco project partners

Source: Web Interface https://alplinkbioeco.tic.heia-fr.ch/visualization_cluster

The midterm workshop in Zurich served to present draft results on clusters and cluster initiatives as well as the status of cluster actors. It also served to upgrade and bring the PP reports to the same level. The workshop enabled the PPs to discuss the structure of the value chains and to identify initial gaps, constraints, missing links/actors, synergies and opportunities.

The regional cluster mapping reports provide a detailed listing of cluster actors as well as suggestions on how they can be grouped along the respective value chains. The grouping serves to identify actors for purposes of assembling the knowledge base in A.T1.3. The selection of clusters/cluster initiatives by individual project partners was done on a subjective basis and according to the willingness of clusters/cluster initiatives to participate in the cluster mapping exercise. Regarding the number of clusters and cluster initiatives identified by PPs the critical mass for further elaboration and development of six predefined and two additional bio-based VCs exist on a cross-regional level. On the PP regional level, the critical mass of clusters and cluster initiatives differ from region to region.

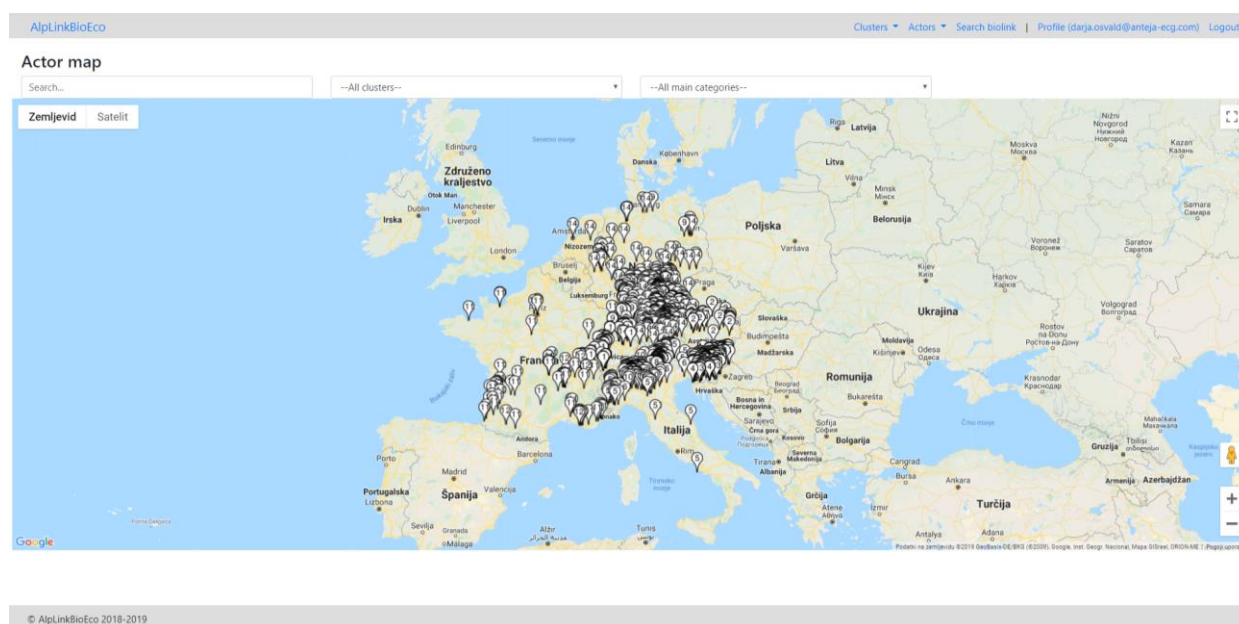


Figure 2: A screenshot of actors' map with information developed by the AlplinkBioEco project partners

Source: Web Interface <https://alplinkbioeco.tic.heia-fr.ch/visualization>

Predefined value chains

VCS encompass the full range of activities required to bring goods or services from conception, through the different stages of production (provision of raw materials, input of various components, subassemblies, producer services and assembly of finished goods), delivery to final consumers and, finally, to disposal after use.

The term 'value chain' describes the fact that as products or services pass through different stages of production, value is added along each stage. This value may be captured within a single actor (in the case of a vertically integrated chain) or may involve several actors at each stage. A single actor can be active in different production stages of the same value chain.

Six value chains were predefined based on clusters included in the web interface database cutting date of 29, April 2019. The predefined value chains are based on bioresources (wood, agriculture, including waste). The cluster structures in the regions of the PPs were jointly discussed and agreed upon. They are as follows:

Bio-based packaging value chain – stages of production:

Raw material production → monomer, raw polymer → blend / compound → extrusion → assembly → trimming / finishing → distribution / packaging / logistic → application → end of life management



Figure 3: Visual map of bio-based packaging value chain production stages based on clusters included in the database

Source: AlpLinkBioEco

Biopolymers value chain – stages of production:

Supply polymer / raw material → compounding / fibre-enhancement → polymer manufacturing → final treatment → assembly / integration → application → end of life management



Figure 4: Visual map of biopolymers value chain production stages based on clusters included in the database

Source: AlpLinkBioEco

Bio-based chemicals value chain – stages of production:

Feedstock production → pre-treatment / pre-processing → conversion → formulation → packaging / logistic → application → end of life management



Figure 5: Visual map of bio-based chemicals value chain production stages based on clusters included in the database

Source: AlpLinkBioEco

Eco-construction value chain – stages of production:

Harvesting of wood → round logs → sawing / milling → applying wood / preservatives → surface treatment / finishing → application → end of life management



Figure 6: Visual map of eco-construction value chain production stages based on clusters included in the database

Source: AlpLinkBioEco

Furniture value chain – stages of production:

Design and pre-production services → raw materials and components → manufacturing → assembly → distribution / packaging / logistic → retails / wholesale → end of life management



Figure 7: Visual map of furniture value chain production stages based on clusters included in the database

Source: AlpLinkBioEco

Food production value chain – stages of production:

Input suppliers → farmers → traders → food processors → packaging / logistic → retailers → end of life management



Figure 8: Visual map of food value chain production stages based on clusters included in the database

Source: AlpLinkBioEco

In addition to the six predefined value chains, **two custom value chains** were identified by the PP to reflect additional bio-based activities of their clusters:

Pharma, fragrance, cosmetics value chain - stages of production:

Feedstock production → pre-treatment / pre-processing → manufacturing → formulation / mixing / assembly → packaging / logistics → application / use → end of life management



Figure 9: Visual map of pharma, fragrance, cosmetics value chain production stages based on clusters included in the database

Source: AlpLinkBioEco

Energy value chain - stages of production:

Feedstock → raw material → manufacturing of carbon source → transport → application / use → end of life management



Figure 10: Visual map of energy value chain production stages based on clusters included in the database

Source: AlpLinkBioEco

1. Description of clusters and cluster initiatives

The following segment shows information on clusters that were part of the cluster mapping exercise through an online web tool developed in the course of the AlpLinkBioEco project. Information shown and data gathered are publicly available on cluster web domains and in public records. The project partners identified 64 clusters/cluster initiatives and mapped 54 clusters connected to relevant predefined value chains whose members are actively involved in the identified value chains. The results show how clusters/cluster initiatives selected by project partners are linked with certain value chains.

Table 1: Summary of regional cluster mapping reports

	Number
Cluster initiatives identified/selected/ in interface	64
Cluster initiatives mapped	54
Cluster actors mapped	1.384
Predefined value chains mapped	109
Proposed value chains by project partners	35

Source: Web interface <https://alplinkbioeco.tic.heia-fr.ch> and regional cluster mapping reports.

Table 2: Total numbers of cluster initiatives and actors mapped in different VC

Predefined value chains	Number of cluster initiatives	Number of actors	Value chains defined by project partners	Number of cluster initiatives	Number of actors
Bio-packaging	23	652	Biopharma, fragrance, cosmetics	19	1.114
Biopolymers	16	212	Energy	12	419
Bio-based chemicals	21	453	Packaging machinery	1	55
Eco-construction	20	453	Beer brewing	1	16
Furniture	15	317	Chipping process	1	4
Food production	14	515	Composting	1	5

Source: Regional cluster mapping reports and the web interface database.

Through the identification of the most relevant and participative cluster initiatives in the context of AlpLinkBioEco, the project partners highlighted the contribution of the cluster initiatives to the predefined and additional cluster value chains. These determinations were based on bioresource applications in the areas of wood, agriculture, food/pharmaceutical packaging and chemistry. Supplementary, two PP proposed additional VCs in packaging machinery for health industry, in beer brewing, chipping process and composting. One cluster initiative could be linked to one or more value chains.

The list of clusters/cluster initiatives mapped by the project partners is included in ANNEX I to this synthesis report.

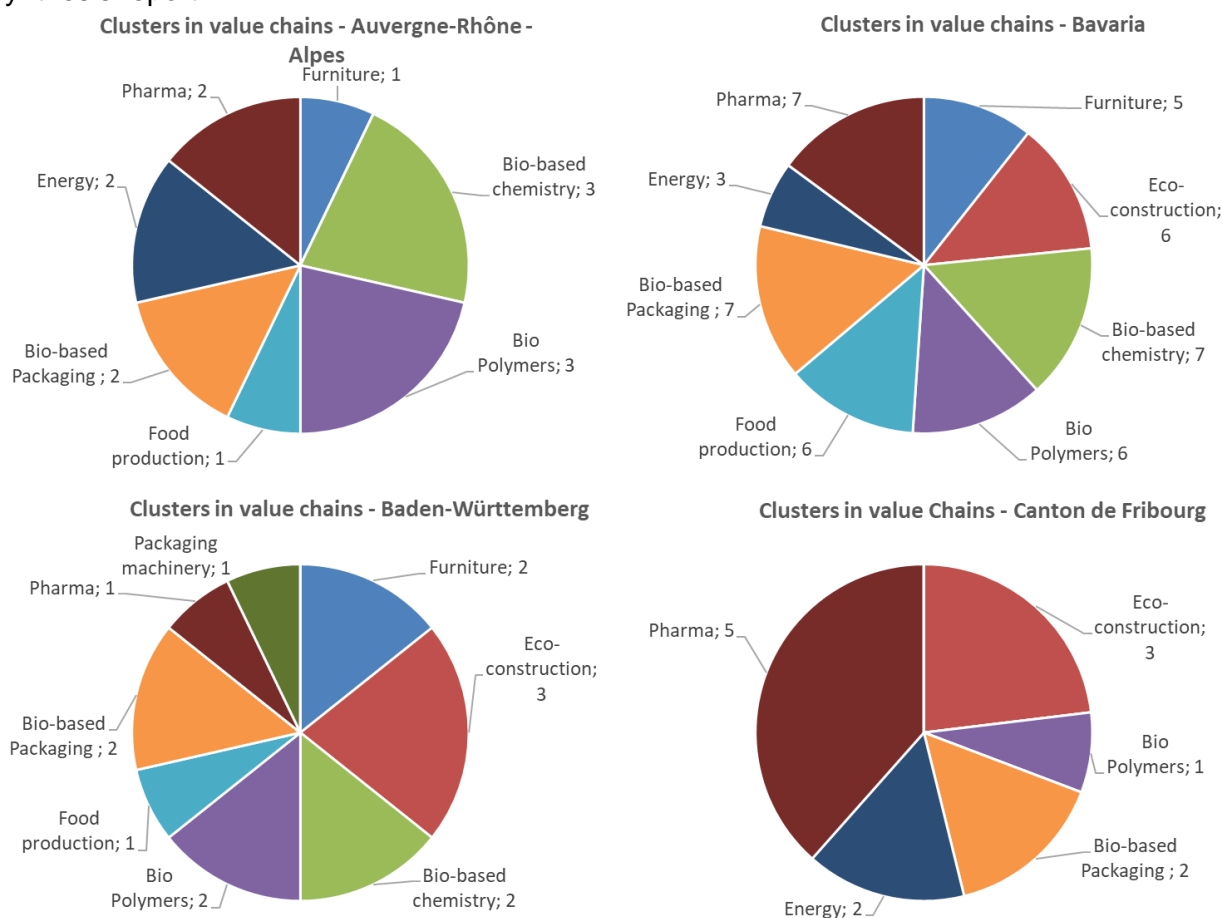


Figure 11/1: Mapping of clusters/cluster initiatives along the predefined and additional value chains by project partners region

Source: Regional Cluster Mapping Reports

In Auvergne-Rhône-Alpes³ (PP11 and PP12) three cluster initiatives are linked to seven predefined and additional value chains. All three cluster initiatives contribute to the bio-based chemistry and bio-based polymers value chains due to their strategic orientation towards bio-based resources.

The Bavarian project partner (PP14) linked seven cluster initiatives to eight predefined and additional value chains. All seven clusters/cluster initiatives are linked to the bio-based chemistry, bio-based packaging value chains as well as the biopharma, fragrance and cosmetics value chains.

In Baden-Württemberg (PP7 and PP9), eleven cluster initiatives contribute to eight predefined and additional value chains. Out of eleven clusters/cluster initiatives, three are contributing to the eco-construction value chain. Two groups of cluster initiatives contribute to the furniture, bio-based chemistry, bio-based packaging and bio-based polymers value chains.

³ Data and information on clusters for Auvergne-Rhône-Alpes include also data and information on clusters for Sud Provence Alps Côte d'Azur.

In Canton de Fribourg (Lead Partner), eight cluster initiatives are linked to five predefined and additional value chains. A group of five cluster initiatives contribute to the biopharma, fragrance, and cosmetics value chain. Three cluster initiatives contribute to the eco-construction value chain and groups of two cluster initiatives contribute to bio-based packaging and energy value chains.



Figure 12/2: Mapping of clusters/clusters initiatives along the predefined and additional value chains by project partners region

Source: Regional Cluster Mapping Reports

The Lombardy project partner (PP6) linked eleven clusters/cluster initiatives to eight predefined and additional value chains. Out of eleven cluster initiatives, six cluster initiatives are linked to a bio-based chemistry value chain. A group of four cluster initiatives are linked to bio-based packaging, energy and biopharma, fragrance, cosmetics value chains.

For Slovenia (PP4 and PP13) four clusters/cluster initiatives are contributing to six predefined value chains. All four clusters are contributing to at least one value chain. Two clusters contribute to two predefined value chains.

The partners of Provincia Autonoma di Trento (PP5 and PP8) selected seven clusters/cluster initiatives that contribute to six predefined value chains. A group of five clusters contribute to the eco-construction value chain. Four clusters contribute to bio-based packaging and two clusters

contribute to wood industry value chains as well as furniture and food production value chains.⁴ Actors producing wooden pallets are included in the packaging value chain.

In Upper Austria (PP2), four clusters are contributing to eight predefined and additional value chains. One cluster is contributing to five predefined and additional value chains.

ANNEX II lists the cluster initiatives in predefined value chains.

2. Figures and findings on mapped clusters along predefined value chains

The cluster mapping was done with the attribution of cluster members along the value chains⁵. The classification of actors was done according to the NACE code⁶ classification accessible in public databases or provided by cluster managers and companies themselves.

The figure below present synthesis of mapped clusters in value chains by PP.

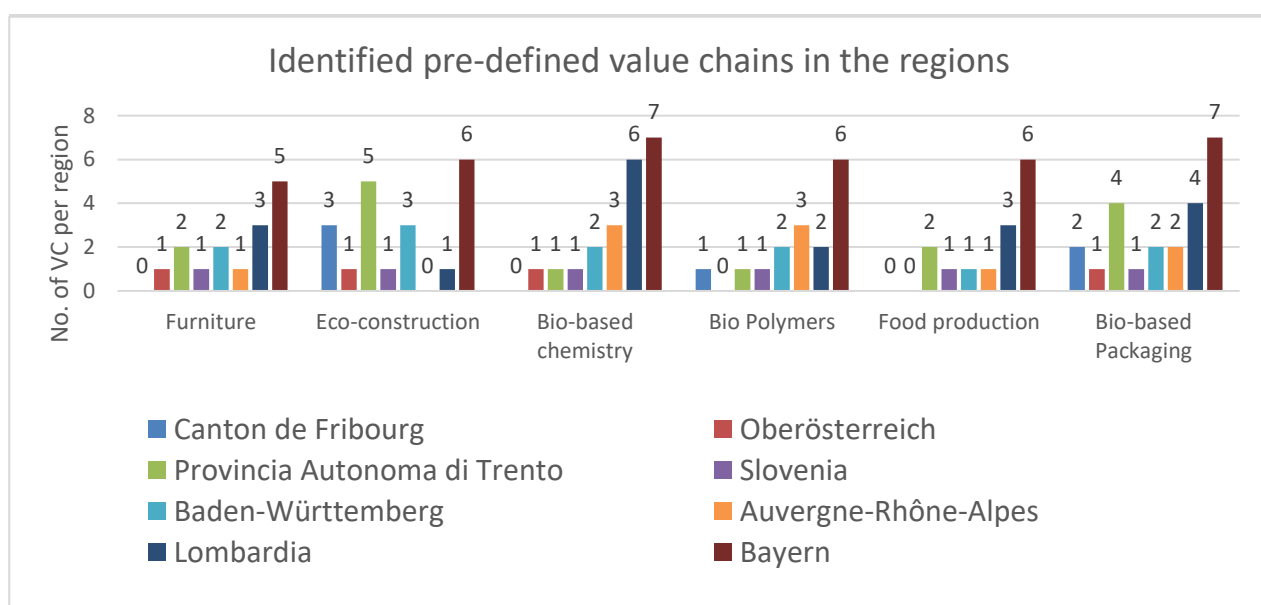


Figure 13: Mapped clusters value chains by PP

Source: Cluster mapping reports

Out of six predefined VCs bio-based packaging is present in all PP regions, followed by bio-based chemistry, eco-construction, furniture, bio-based polymers and food production VC. The size of the different nodes/stages of production (NACE classifications) is not proportional to the total number of actors as some actors are operating in more than one production phase.⁷ Not all cluster members/companies are mapped along the value chains⁸.

⁴ The cluster mapping in its form does not present the whole region status, only the clusters linked or managed by project partners and willing to participate. The partners of Provincia Autonoma di Trento (PP5 and PP8) indicated one important cluster of the Region Piedmont in the food production value chain, and in the eco-construction cluster some actors from South Tyrol were included who are part of the national association Federlegno Arredo.

⁵ The value chains maps were designed to identify the nodes (stages of production) themselves.

⁶ According to NACE Rev. 2 2008; Eurostat – Methodologies and Working Papers (2008), ISSN 1977-0375

⁷ Data sources for mapping actors along value chains are regional cluster mapping reports and the web interface database.

⁸ The selection of clusters/cluster initiatives was done by individual project partner on subjective basis.

The comparison of value chains illustrated the prevailing VCs. The bio-based packaging and biopolymer VCs prevail in Fribourg and Bavaria. The bio-based chemicals value chain prevails in Auvergne-Rhône-Alpes, Bavaria and Lombardy. While the eco-construction value chains are strong in almost all regions, the furniture VC in Trentino can be highlighted. Trentino and Bavaria have strong food value chains while Bavaria, Lombardy and Fribourg are strong in bio energy.

It is relevant to note that the pharma, fragrance and cosmetics value chain has strong representation in Fribourg, and Lombardy followed by Auvergne-Rhône-Alpes and Baden-Württemberg.

Bio-based packaging value chain

The Bio-based Packaging value chain composition illustrated in Table 3, based on the intensive work of the project partners, is based on 652 actors and their related NACE classifications identified. The biggest share of actors (about 55%) operate in the sector “manufacture of plastic packaging goods” (NACE codes C20.00 and C22.21). About 22,5 % of the actors deal with “manufacture of products of wood and corrugated paper and paperboard” (NACE codes C16.00 and C17.21).

The bio-based packaging VC involves mapped actors in each stage of the VC. For bio-based packaging, the feedstock to produce bioplastics is derived from plants rather than fossil fuels. The Bavaria and Fribourg packaging VC combines numerous actors along the whole value chain and could be considered as the strongest regions in bio-based packaging. The biggest share of actors is at the beginning of the value chain mostly dealing with conventional bio-based packaging (paper, cellulose, wooden pallets). This is the case in Provincia Autonoma di Trento and Canton de Fribourg. A gap identified in other regions is the lack of raw material availability for bio-based plastics/films. These include Polylactide (PLA), Polybutylene succinate (PBS), cellulose acetate, bio-based Polyethylene (PE), biodegradable polyester and starch which can be transformed into raw monomers.

Table 3: Number of actors in production stages of pre-defined bio-based packaging VC

PP region	Number of actors in VC production stages								
VC production stages	Raw Material Production	Monomer/ raw polymer	Blend/ compound	Extrusion	Assembly	Trimming/ finishing	Distribution / packaging/ logistic	Application	End of life management
Primary NACE codes	01.00; 02.00; 08.11; 10.00; 16.00; 16.24; 17.11; 17.21;	17.11; 17.20; 20.10; 20.13; 20.16; 22.29;	20.13; 22.20; 22.22; 23.00;	20.16; 22.21; 22.29; 46.18;	18.12; 20.10; 22.20; 22.21; 22.22; 22.29;	17.21; 22.21; 23.00; 28.10; 28.49; 28.96;	22.21; 22.29;	22.21; 23.10; 32.50; 72.00;	17.21; 72.00; 72.10; 82.99; 84.13;
Auvergne-Rhône-Alpes	1	1	1	12	2	1	4	1	1
Baden-Württemberg	0	0	1	11	7	8	2	0	0
Bavaria	10	14	19	24	29	23	15	13	6
Canton de Fribourg	93	2	36	10	16	0	17	136	18
Lombardy	0	0	13	8	11	7	5	14	0
Slovenia	2	2	1	1	1	6	3	2	5
Upper Austria	0	1	1	1	0	1	1	1	0
Provincia Autonoma di Trento	86	9	12	13	42	42	31	2	1
Total actors by stage of production	192	29	84	80	108	88	78	169	31
Total VC actors mapped	652								

A Hemp, algae and by-products from the food industry and wastewater can be used to produce raw materials like in Slovenia. In most cases, on the regional level, the bio-based packaging value chain is not closed, and the regional actors cover mostly the manufacturing stage of production/application (NACE 20). The end-of-life stage for bio-based packaging is also a challenge because of inadequate waste management infrastructure and general public awareness.

Existing individual clusters are more or less sectoral and do not cover the whole value chain. This is also demonstrated by the concentration of cluster actors in “production/assembly/application” (NACE code 20) in selected predefined VCs. The cooperation of more clusters can ensure covering the whole value chain.

Manufacturing of bio-polymers value chain

The bio-polymers manufacturing value chain is developing. Raw materials derive from agriculture resources (food by-products, waste, cellulose), from microorganisms and from biotechnology. The actors in this value chain are not yet linked.

The manufacturing of bio-polymers value chain composition illustrated in Table 4 is based on 212 actors and their related NACE classifications identified. The biggest share of actors (about 73 %) operate in the sector “manufacture of bio-polymers products” (NACE codes C20.16 and C22.20). About 13% of the actors deal with “scientific research and development of bio-based polymers” (NACE codes M72.00).

Gaps identified are raw material availability, assembly, distribution and end of life management. Most of the actors are located in Bavaria and the Canton de Fribourg.

Table 4: Number of actors in production stages of pre-defined bio-polymers VC

PP region	Number of actors in VC production stages						
VC production stages	Supply polymer/raw material	Compounding/ fibre-enhancement	Polymer manufacturing	Final treatment	Assembly / integration	Application	End of life management
Primary NACE codes	01.10; 01.16; 01.29; 02.10; 02.20; 20.14;	13.96; 20.10; 20.13; 20.16; 22.23; 20.59; 28.93;	10.40; 13.96; 16.21; 20.10; 20.16; 20.52; 20.59; 22.20; 28.10; 28.90;	20.10; 20.13; 20.14; 22.21; 22.23; 20.59; 28.93;	10.40; 20.14; 22.20; 22.23; 22.29; 28.96;	10,40;22.2; 22.23;22.2972 .00;	22,23; 22,29; 72.10;72.11; 94.00;
Auvergne-Rhône-Alpes	0	2	8	7	4	0	2
Baden-Württemberg	1	4	3	2	2	6	2
Bavaria	12	10	18	20	19	6	4
Canton de Fribourg	22	36	2	0	0	68	1
Lombardy	0	1	3	3	3	3	0
Slovenia	2	0	0	2	0	0	0
Upper Austria	0	0	0	0	0	0	0
Provincia Autonoma di Trento	0	1	1	1	9	9	0
Total actors by stage of production	37	54	35	35	37	92	9
Total VC actors mapped	212						

Bio-based chemicals value chain

The manufacturing of bio-based chemicals value chain composition illustrated in Table 5 is based on 453 actors and their related NACE classifications identified. The biggest share of actors (about 38% %) operate in the sector “manufacture of chemicals and chemical products” (NACE codes C20.00, C20.14 and C20.59). About 10% of the actors deal with “manufacture of plastic products” (NACE codes C22.20 and C22.21) and “water treatment, waste collection and disposal” (NACE codes E36.00 and E38.00).

The bio-based chemicals value chain also involves actors that are not necessarily members of clusters. This value chain is covered on a cross-regional level. On individual region levels, the value chain is not fully covered, and the actors are not always linked. The feedstock production stage of the value chain is not covered in most regions as actors are outside of the value chain. Furthermore, the actors in packaging and logistics are not linked. The end-of-life management is mainly operated by actors mapped in Auvergne-Rhône-Alpes and Bavaria.

Table 5: Number of actors in production stages of pre-defined bio-based chemicals VC

PP region	Number of actors in VC production stages						
VC production stages	Feedstock production	Pre-treatment / pre-processing	Conversion	Formulation	Packaging / logistic	Application	End of life management
Primary NACE codes	01.29;01.60; 02.00;02.10; 02.20;10.00; 10.40;10.62;	10.00; 10.40; 10.62; 13,95; 16.00;	17,11; 20.12; 20.20;20.52;	20.12; 20.13; 20.14;20.16; 20.41; 22.20; 22.21;	28.96; 46,75;	22.20; 22.21;	36,00;38.00; 38.32;70.10; 72,10;74.90; 84,13;
Auvergne-Rhône-Alpes	13	8	26	45	14	5	8
Baden-Württemberg	1	0	1	7	2	9	5
Bavaria	38	33	28	73	31	67	40
Canton de Fribourg	0	0	0	0	0	0	0
Lombardy	2	46	56	58	15	50	2
Slovenia	1	1	2	5	0	1	0
Upper Austria	0	1	1	1	0	1	0
Provincia Autonoma di Trento	0	2	2	2	2	2	0
Total actors by stage of production	55	91	117	191	64	135	55
Total VC actors mapped	453						

Eco-construction value chain

The eco-construction value chain composition presented in Table 6 is based on more than 453 actors and their related NACE classifications identified. As table 6 illustrates the biggest share of actors (about 76 %) operate in the sector “forestry and logging of wood” (NACE codes A02.00, A02.10 and A20.20) and “sawmilling and manufacture of wooden applications” (NACE codes C16.10, C17.10 and F41.00).

The eco-construction value chain is well developed in most of the 8 regions but not all clusters from this sector were willing to participate in this cluster mapping exercise. Traditional wood value chains including eco-construction and furniture are well developed in almost all regions. Most actors in the VC are associated with the nodes “round logs”, “sawing/milling” and “application”. The actors are operating in different stages of production. In some cases, like in Provincia Autonoma di Trento, the major part of the VC is covered by the same actor (large company). This provides turn-key wooden house projects which start the production line with their own sawmill. The end-of-life management of eco-construction (collection and recycling of wooden elements) is not covered by the selected actors interviewed. The circularity of eco-constructed buildings and furniture (end of life waste - reuse, recycling and energy production) is not yet established in almost all partners regions. The exceptions are the Trentino, Bavaria and Canton de Fribourg regions.⁹ Wood, as a bio-based resource, is available in all partner regions. However, in some cases the wood is also imported from other regions.

⁹ Regional/national variations are possible, information and findings only apply to selected clusters and actors.

Table 6: Number of actors in production stages of pre-defined eco-construction VC

PP region	Number of actors in VC production stages						
VC production stages	Harvesting of wood	Round logs	Sawing / milling	Applying wood / preservatives	Surface treatment / finishing	Application	End of life management
Primary NACE codes	01.60; 02.00; 02.10; 46.49;	02.10; 02.20;	16.10; 16.21; 17.11; 26.30;	17.11; 20.13; 26.30; 71.00;	16.23; 20.41; 23.32; 25.61; 28.10; 43.99;	16.23; 23.32; 26.10; 32.00; 41.00; 43.99; 47.52;	26.10; 43.99; 71.00; 94.00;
Auvergne-Rhône-Alpes	0	0	0	0	0	0	0
Baden-Württemberg	21	21	13	11	11	67	0
Bavaria	3	5	41	21	19	15	5
Canton de Fribourg*	(250.000)	N/A	(10.000)	(10.000)	(10.000)	(10.050)	(1.000)
Lombardy	0	0	1	0	0	0	0
Slovenia	5	13	32	3	2	14	0
Upper Austria	0	0	0	0	0	1	0
Provincia Autonoma di Trento	3	39	70	3	22	162	1
Total actors by stage of production	137	32.085	157	10.226	59	509	7
Total VC actors mapped	453						

*Refers to the total number of members of the interest organisation Waldschweiz (wood and forest owners) from Switzerland.

Furniture value chain

The furniture value chain composition presented in Table 7 is based on more than 317 actors and their related NACE classifications identified. As Table 7 illustrates, the biggest share of actors (about 64 %) operate in the sector “manufacture of wood and of products from wood” (NACE codes C16.00, C16.10 and C16.23) and “manufacture of other furniture and construction activities” (NACE codes C31.09, and C43.99).

The furniture value chain is well developed as it is a traditional industry. The residues from wood are currently not used for high value chains in different applications. A missing link exists at the end of the VC where circularity of both eco-construction and furniture is not yet established (end-of-life waste - reuse, recycling and energy production).

Table 7: Number of actors in production stages of pre-defined furniture VC

PP region	Number of actors in VC production stages						
VC production stages	Design and pre-production services	Raw materials and components	Manufacturing	Assembly	Distribution /packaging /logistic	Retail/ wholesale	End of life management
Primary NACE codes	31.00;43.99; 72.11;84.13; 94.11;	16.00; 16.10; 16.21; 17.21; 20.13; 22.21;	16.21; 16.23; 20,30;28.10; 31.09;	31.09; 43.99;	17.21; 43.99; 46.19; 47.52; 47.53;	22,29; 31.09; 43.99; 47.52;	16.23; 31.09; 74.10; 90.00;
Auvergne-Rhône-Alpes	0	2	8	0	5	0	1
Baden-Württemberg	5	4	3	1	1	4	3
Bavaria	3	30	8	6	6	6	1
Canton de Fribourg	0	0	0	0	0	0	0
Lombardy	1	1	4	4	3	1	1
Slovenia	1	2	22	0	1	3	0
Upper Austria	0	0	23	0	0	0	0
Provincia Autonoma di Trento	64	78	67	66	38	20	0
Total actors by stage of production	74	117	135	77	54	34	6
Total VC actors mapped	317						

Food production value chain

The food production value chain composition illustrated in Table 8 is based on 341 mapped actors and their related NACE classifications identified. The biggest share of actors (about 49 %) operate in the sector “manufacture of food products” (NACE codes C10.00, C10.40, C10.50 and C10.60). About 13% of the actors deal with “support services and scientific research” (NACE codes M71.20 and M72.00).

The food production value chain is well developed in the regions of Bavaria, Auvergne-Rhône-Alpes and Provincia Autonoma di Trento. There are constant breakthroughs in supplementing traditional processes with bio-based production of consumer products as well as animal feed. Thus, new actors need to be identified along these newly established sub-value chains (e.g., healthy soil, organic farming in extreme conditions, traceability and others). The food production VC is well developed in the Lombardy Region. At the level of the Canton de Fribourg, food production is of crucial strategic importance and benefits from a strong business environment in the field. However, regarding the bio-based applications, the value chain shows slow growth, especially in the end-of-life management in which new actors need to be linked. The whole agricultural sector, including the food processing industry, produces a high volume of waste and by-products from food, winery, distillery, brewery and fruit processing which can be used for high added value compounds. Still, there is a lack of skills and a gap in the biomass exploitation plans. Furthermore, knowledge about new opportunities regarding bio-based materials is not widespread.

Table 8: Number of actors in production stages of pre-defined food production VC

PP region	Number of actors in VC production stages						
VC production stages	Input suppliers	Farmers	Traders	Food processors	Packaging / logistic	Retailers	End of life management
Primary NACE codes	01.11;01.49; 03.22;10.11; 10.39;10.51; 11.01; 46.31; 72.00;	01.24;01.49; 03.22; 10.51;11.02;	10.51;11.05; 43.99; 46.31;	10.00; 10.39; 10.40;10.51; 10.61; 10.83; 20.13;	10.00; 72.11;	46.31;46.36; 47.22;	01.11; 10.51; 10.91; 71.20; 72.19;
Auvergne-Rhône-Alpes	21	7	1	12	0	0	0
Baden-Württemberg	0	1	2	7	4	1	0
Bavaria	22	19	15	47	49	50	2
Canton de Fribourg*	(105)	(32.007)	0	(10.188)	(5)	(250)	(1)
Lombardy	1	3	2	3	2	1	0
Slovenia	8	4	1	4	0	1	2
Upper Austria	0	0	0	0	0	0	0
Provincia Autonoma di Trento	23	23	24	69	33	11	2
Total actors by stage of production	75	57	45	142	88	64	6
Total VC actors mapped	515						

*Refers to the total number of members of the interest organisation Schweizer Bauernverband, SwissOlio and Cluster Food&Nutrition.

Bio-energy value chain

The bio-energy value chain composition illustrated in Table 9 is based on 268 mapped actors and their related NACE classifications identified. The biggest share of actors (about 40 %) operate in the sectors “agriculture and forestry” (NACE codes A01.00 and A02.00). About 23% of the actors deal with “production of electricity” (NACE code D35.11), and 13% of actors deal with “waste collection, treatment and disposal including materials recovery activities” (NACE code E38.00).

Table 9: Number of actors in production stages of pre-defined bio-energy VC

PP region	Number of actors in VC production stages					
VC production stages	Feedstock	Raw material	Manufacturing of carbon source	Transport	Application / use	End of life management
Primary NACE codes	01.00;01.16; 01.63;02.10; 02.20;38.00;	16.10;25.62; 35.11;38.32; 46.75;72.11;	10.40;20.11; 20.14; 25.62; 35.11; 38.32; 46.75;	16.10;20.59; 35.11;36.00; 38.00;38.32;	20.14;25.62; 35.11;36.00; 72.19;	20.14;35.11; 38.00;70.22; 71.20;72.19;
Auvergne-Rhône-Alpes	0	0	3	0	1	0
Baden-Württemberg	0	0	0	0	0	0
Bavaria	41	42	38	38	34	36
Canton de Fribourg*	(20)	(60)	(50)	0	0	0
Lombardy	0	14	11	8	16	7
Slovenia	0	0	0	0	0	0
Upper Austria	0	0	0	0	0	0
Provincia Autonoma di Trento	0	0	0	0	0	0
Total actors by stage of production	61	116	102	46	51	43
Total VC actors mapped	419					

*Refers to the total number of members of the interest organisation Schweizer Bauernverband and SwissOlio.

This additional value chain was defined by individual project partners Bavaria, Canton de Fribourg and Lombardy. The bio-energy value chain shows a gap in feedstock production in Lombardy and Auvergne-Rhône-Alpes. Transport, application and end of life management stage are not covered

by any of the members of the mapped clusters in Canton de Fribourg. Other partners have not attributed actors to this value chain. The bio-energy sector is very important for almost all regions. The presence of good management and effective recovery of biodegradable waste could help to support the development of this value chain.

The pharma, fragrance and cosmetics value chain

The pharma, fragrance and cosmetics value chain composition illustrated in Table 10 is based on 1.014 mapped actors and their related NACE classifications identified. The biggest share of actors (about 60 %) operate in the sector “wholesale and retail sale of food in specialized stores” (NACE codes G46.27 and G47.29). About 21% of the actors deal with “manufacture of perfumes and toilet preparations” (NACE code C20.42).

Table 10: Number of actors in production stages of pre-defined pharma, fragrance and cosmetics VC

PP region	Number of actors in VC production stages						
VC production stages	Feedstock production	Pre-treatment / pre-processing	Manufacturing	Formulation / mixing / assembly	Packaging / logistics	Application / use	End of life management
Primary NACE codes	02.10;20.14; 20.40;20.59; 72.11;	20.13;20.14; 20.40;20.60; 21.20;28.10;	20.12;20.14; 20.40; 21.20; 28.10;	20.13;20.14; 20.40;28.93; 47.29;72.11;	17.21;20.52; 22.21;22.29; 23.00;25.61; 26.00;28.96; 47.29;	71.20;	72.00;
Auvergne-Rhône-Alpes	0	2	19	8	0	0	0
Baden-Württemberg	1	0	1	3	0	4	0
Bavaria	6	9	6	9	26	2	1
Canton de Fribourg*	(1)	(10)	(28)	(702)	(150)	(0)	(2)
Lombardy	0	31	35	35	3	20	0
Slovenia	0	0	0	0	0	0	0
Upper Austria	0	0	0	0	0	0	0
Provincia Autonoma di Trento	0	0	0	0	0	0	0
Total actors by stage of production	8	52	89	757	179	26	3
Total VC actors mapped	1.114						

*Refers to the total number of members of technology site PhytoArk and CI Schweizerischer Drogistenverband. According to the web interface database 4 actors are mapped to date.

This additional value chain was defined by individual project partners. Some regions, like Lombardy, Canton the Fribourg, Auvergne-Rhône-Alpes and Baden-Württemberg, are specialized in the phytopharmaceutical industry. The presence of big players in those regions promotes the development of new products and fields of research such as biotech and pharmaceuticals. The pharma, fragrance and cosmetic VC shows a gap in the feedstock production and in the end-of-life management steps. The actors in feedstock production exist in some regions but are not linked to the value chain or to the cluster of independent growers of medicinal and aromatic plants.

3. Missing links along the selected value chains

Visualization and classification of cluster members was used to determine the constraints, gaps, and missing links along the specific value chains. Thus, giving additional data on obstacles and opportunities per region.

For purposes of the synthesis report, the common gaps identified are listed. Specific deviations exist from region to region and they are listed in the individual regional cluster mapping reports. In some cases, gaps and opportunities of each region can be complementary.

The **main gaps and missing links** identified along the **bio-based packaging value chain**¹⁰ are:

- high prices of raw materials,
- lack of raw materials and first transformation into monomers,
- lack of strategic plans for rural biomass exploitation,
- missing end-of-life management, infrastructure and services.

Missing links were identified in the supply of raw materials from the agriculture/food industry, market demand and end-of-life management.

The **main gaps** identified along the **manufacturing of bio-polymers value chain** are:

- production of biomaterial as a raw material is too low,
- supply of bio-sources is not organised/managed,
- end-of-life management, infrastructure and services are missing.

Missing links were identified in the supply of raw material, market demand and cross-regional connections and networks.

The **main gaps** identified along the **bio-based chemicals value chain** are:

- supply of bio-resources is not organised/managed,
- production of biomaterial as a raw material is too low (feedstock), some bio-resources are not sufficiently exploited,
- end-of-life management, infrastructure and services are missing,
- in pre-treatment and processing stage of bio-based chemicals.

In the bio-based chemicals value chain, **missing links** to suppliers of bio-based raw material and cross-regional connections and networks were identified.

In almost all predefined VCs, the gap in the last production stage end-of-life management is identified. It is recommended to PPs to complement and expand data on end-of-life management (investments and services) by involving relevant actors/stakeholders to closing the VC.

The **main gaps** identified along the **eco-construction value chain** are:

- supply of bio-resources (wood) in some regions is not properly organised/managed,

¹⁰Bio-based plastics/films. This is not applying for wood based packaging (pallets, wooden boxes etc.).

- end-of-life management, infrastructure and services are missing. (The priority is energy generation.),
- residues from wood are currently not used in different applications in the pre-treatment and processing stages.

In the eco-construction value chain, **missing links** were identified with regard to consumer-oriented products, cross-regional networks and general circularity.

The **main gaps** identified along **the food value chain** are:

- use of waste and by-products,
- end-of-life management, waste stream utilization,
- slow development of bio-based applications,
- traceability of input resources (especially for imported resources),
- collection and management of agricultural and food processing waste.

In the food value chain, **missing links** for waste integration into other VCs were identified along with inadequate communication between actors (farmers/industry/consumers), insufficient cross-regional connections and networks, lack of knowledge of innovative value chains and a lack of circularity.

The knowledge of bio-based VCs can be deeper through activities A.T.3.1 demonstration of VCs by implementing pilot actions on cross regional level.

4. Opportunities, future perspectives and potential cross regional synergies along selected value chains

The analysis of the actors operating in the selected value chains showed that a large portion of the productive activities is focused on the bio-based packaging value chain accounting for 652 mapped actors. This is followed by “traditional” sectors like the eco-construction and bio-based chemicals value chains which account for 453 actors each.

During the manufacturing process of products from wood or agriculture, many potential by-products or reusable waste are generated that could be integrated into other applications. For example, during the production process of fertilizers, a gaseous fraction is generated which could be converted into bioenergy, such as biogas (then upgraded to biomethane). The agriculture-based industries focus their productive activities on production of food and nutraceutical compounds. The generation of food waste and by-products in the agro-food supply chain could be integrated within the energy value-chain and for biopolymer production.¹¹

For the **bio-based packing**, **bio-polymer manufacturing** and **chemicals** value chains, the cluster mapping analysis shows that opportunities and potentials can be found in the following:

- continuous supply chain of raw materials for the region,

¹¹ See document AlpLinkBioEco – “Benefits and opportunities of bio-based economy value chains”, 2019

- solving the issue of the exploitation of agricultural products for non-food processes,
- separation/collection policy of biodegradable parts from non-biodegradable parts,
- synergies that can be activated by the end-of-life management,
- the missing links of the value chain that cannot be covered in the region and which should be taken into consideration in cross-regional networks and intersections with related value chains.

Wood/cellulose is the most common used bio-based raw material.

For the promotion of regional and cross-regional complementarity in bio-based VCs (i.e. existing good practices of relevant actors' collaborations) should be identified and promoted.

Eco-construction and furniture are emerging markets. Regarding the future perspectives, there is a huge potential within the eco-construction sector. The demand for environmentally friendly products increases from year to year due to a relatively wide variety of possible products. When we look at the eco-construction and furniture value chains, the cluster mapping analysis shows opportunities and potential as follows:

- Reuse of wood products and furniture
- Complementarity with the packaging industry
- Cross-regional cooperation
- Knowledge exchange
- Synergies with bio-based chemistry and bio-polymers
- Cooperation in R&D activities
- Investments into end-of-life infrastructure and availability of specialized services.

The food value chain, as a biomass resource, is one of the most important value chains in terms of its global societal and environmental implications. The cluster mapping analysis shows that opportunities and potential of the food value chain include:

- Strengthening the cooperation of different industry sectors (with agriculture)
- Waste integration into other bio-based value chains
- Diversification of by-products
- R&D cooperation (in the new framework programme Horizon Europe)

ANNEX I: List of clusters/cluster initiatives mapped by project partners

	Name of cluster/cluster initiative	Added by
1	Axelera	PP12 (Auvergne-Rhône-Alpes)
2	CIMES (Viameca)	PP11 (Auvergne-Rhône-Alpes)
3	Cluster Bio Auvergne-Rhône-Alpes	PP11 (Auvergne-Rhône-Alpes)
4	Cluster Eco Energies	PP11 (Auvergne-Rhône-Alpes)
5	Elastopôle	PP11 (Auvergne-Rhône-Alpes)
6	Novachim	PP12 (Auvergne-Rhône-Alpes)
7	Plastipolis	PP11 (Auvergne-Rhône-Alpes)
8	Pole Eco Conception	PP11 (Auvergne-Rhône-Alpes)
9	Techtera	PP11 (Auvergne-Rhône-Alpes)
10	Tenerrdis	PP11 (Auvergne-Rhône-Alpes)
11	Terralia	PP12 (Auvergne-Rhône-Alpes)
12	Vegepolys Valley	PP12 (Auvergne-Rhône-Alpes)
13	Xylofutur	PP11 (Auvergne-Rhône-Alpes)
14	BioCampus Straubing GmbH	PP14 (Bavaria)
15	Chemie-Cluster Bayern GmbH	PP14 (Bavaria)
16	Cluster Ernährung	PP14 (Bavaria)
17	Cluster Forst und Holz in Bayern	PP14 (Bavaria)
18	Cluster Neue Werkstoffe c/o Bayern Innovativ	PP14 (Bavaria)
19	Umweltcluster Bayern	PP14 (Bavaria)
20	Zentrum für Lebensmittel- und Verpackungstechnologie e.V.	PP14 (Bavaria)
21	AFBW Allianz Faserbasierte Werkstoffe	PP7 (Baden-Württemberg)
22	BIOPRO Baden-Württemberg GmbH	PP7 (Baden-Württemberg)
23	Chemie und Pharma am Hochrhein	PP9 (Baden-Württemberg)
24	food.net:z – Lebensmittelnetzwerk Rhein-Neckar e.V.	PP7 (Baden-Württemberg)
25	Holzkette Schwarzwald e.V.	PP7 (Baden-Württemberg)
26	INNONET Kunststoff	PP9 (Baden-Württemberg)
27	KunststoffDIALOG c/o Wirtschaftsförderung Raum Heilbronn	PP7 (Baden-Württemberg)
28	Netzwerk Holzindustrie Baden-Württemberg e.V.	PP9 (Baden-Württemberg)
29	Packaging Excellence Region Stuttgart e.V.	PP7 (Baden-Württemberg)
30	proHolz Schwarzwald	PP9 (Baden-Württemberg)
31	RegioHOLZ BW	PP9 (Baden-Württemberg)
32	Schweizerischer Drogistenverband	Lead Partner (Canton de Fribourg)
33	Cluster Food & Nutrition	Lead Partner (Canton de Fribourg)
34	PhytoArk	Lead Partner (Canton de Fribourg)
35	Schweizer Bauernverband	Lead Partner (Canton de Fribourg)
36	Schweizerischer Bäcker-Confiseurmeisterverband	Lead Partner (Canton de Fribourg)
37	Swiss Plastics Cluster	Lead Partner (Canton de Fribourg)
38	SwissOlio Genossenschaft - Verband Schweizerischer Hersteller von Speiseölen, Speisefetten und Margarinen	Lead Partner (Canton de Fribourg)
39	Waldschweiz	Lead Partner (Canton de Fribourg)
40	Assobiotec - Italian Association for the Development of Biotechnology	PP6 (Lombardy)
41	Assolombarda	PP6 (Lombardy)

	Name of cluster/cluster initiative	Added by
42	Confindustria Lombardia	PP6 (Lombardy)
43	Federalimentare	PP6 (Lombardy)
44	FederlegnoArredo - Lombardia	PP6 (Lombardy)
45	Lombardy Energy Cleantech Cluster - LE2C	PP6 (Lombardy)
46	Lombardy Green Chemistry Cluster - LGCA	PP6 (Lombardy)
47	Lombardy High Tech Agrofood Cluster - CAT.AL	PP6 (Lombardy)
48	National Federation of Chemical Industry - Federchimica	PP6 (Lombardy)
49	Smart cities and communities	PP6 (Lombardy)
50	SPRING - Cluster Tecnologico Nazionale della Chimica Verde	PP6 (Lombardy)
51	Poly4Eml	PP4 (Slovenia)
52	Wood Industry Cluster	PP4 (Slovenia)
53	Slovenian Plasttechnics Cluster	PP13 (Slovenia)
54	SRIP HRANA	PP13 (Slovenia)
55	Coldiretti	PP5 (Provincia Autonoma di Trento)
56	Commerce Chamber - Wood	PP8 (Provincia Autonoma di Trento)
57	Confindustria Trento	PP8 (Provincia Autonoma di Trento)
58	FederlegnoArredo - Trentino and South Tyrol	PP5 (Provincia Autonoma di Trento)
59	Habitech	PP8 (Provincia Autonoma di Trento)
60	Polo di Innovazione Agroalimentare	PP5 (Provincia Autonoma di Trento - Piemonte region)
61	Progetto Manifattura	PP8 (Provincia Autonoma di Trento)
62	Cleantech-Cluster	PP2 (Upper Austria)
63	Food Cluster	PP2 (Upper Austria)
64	Furniture and Timber Construction Cluster	PP2 (Upper Austria)
65	Plastics Cluster	PP2 (Upper Austria)

Source: Web Interface database December 2019

ANNEX II: Clusters/cluster initiatives in predefined value chains

Bio-based Packaging value chain	Project partner
Slovenian Plasttechnics Cluster: Bio-based Packaging	PP13 (Slovenia)
Plastipolis: Bio-based Packaging	PP11 (Auvergne-Rhône-Alpes)
Novachim: Bio-based Packaging	PP12 (Auvergne-Rhône-Alpes)
KunststoffDIALOG c/o Wirtschaftsförderung Raum Heilbronn: Bio-based Packaging	PP7 (Baden-Württemberg)
INNONET Kunststoff: Bio-based Packaging	PP9 (Baden-Württemberg)
Cluster Forst und Holz in Bayern: Bio-based Packaging	PP14 (Bavaria)
Cluster Ernährung : Bio-based Packaging	PP14 (Bavaria)
Cluster Neue Werkstoffe c/o Bayern Innovativ: Bio-based Packaging	PP14 (Bavaria)
BioCampus Straubing GmbH: Bio-based Packaging	PP14 (Bavaria)
Zentrum für Lebensmittel- und Verpackungstechnologie e.V.: Bio-based Packaging	PP14 (Bavaria)
Umweltcluster Bayern: Bio-based Packaging	PP14 (Bavaria)
Chemie-Cluster Bayern GmbH: Bio-based Packaging	PP14 (Bavaria)
Swiss Plastics Cluster: Bio-based Packaging	Lead (Canton de Fribourg)
Cluster Food & Nutrition: Bio-based Packaging	Lead (Canton de Fribourg)
National Federation of Chemical Industry - Federchimica: Bio-based Packaging	PP10 (Lombardy)
Lombardy Green Chemistry Cluster - LGCA: Bio-based Packaging	PP10 (Lombardy)
Smart cities and communities: Bio-based Packaging	PP10 (Lombardy)
Confindustria Lombardia: Bio-based Packaging	PP10 (Lombardy)
Cleantech-Cluster: Bio-based Packaging	PP2 (Upper Austria)
Plastics Cluster: Bio-based Packaging	PP2 (Upper Austria)
Commerce Chamber - Wood: Bio-based Packaging	PP8 (Provincia Autonoma di Trento)
Polo di Innovazione Agroalimentare: Bio-based Packaging	PP5 (Provincia Autonoma di Trento - Piemonte Region)
Confindustria Trento: Bio-based Packaging	PP5 (Provincia Autonoma di Trento)
FederlegnoArredo - Trentino and South Tyrol: Bio-based Packaging	PP5 (Provincia Autonoma di Trento)
Bio-based Chemicals value chains	
Poly4Eml: Bio-based Chemicals	PP4 (Slovenia)
Plastipolis: Bio-based Chemicals	PP11 (Auvergne-Rhône-Alpes)
Vegepolys Valley: Bio-based Chemicals	PP12 (Auvergne-Rhône-Alpes)
Novachim: Bio-based Chemicals	PP12 (Auvergne-Rhône-Alpes)
INNONET Kunststoff: Bio-based Chemicals	PP9 (Baden-Württemberg)
Chemie und Pharma am Hochrhein: Bio-based Chemicals	PP9 (Baden-Württemberg)
Cluster Forst und Holz in Bayern: Bio-based Chemicals	PP14 (Bavaria)
Cluster Ernährung: Bio-based Chemicals	PP14 (Bavaria)
Cluster Neue Werkstoffe c/o Bayern Innovativ: Bio-based Chemicals	PP14 (Bavaria)
Zentrum für Lebensmittel- und Verpackungstechnologie e.V.: Bio-based Chemicals	PP14 (Bavaria)
Umweltcluster Bayern: Bio-based Chemicals	PP14 (Bavaria)
Chemie-Cluster Bayern GmbH: Bio-based Chemicals	PP14 (Bavaria)
BioCampus Straubing GmbH: Bio-based Chemicals	PP14 (Bavaria)
Lombardy High Tech Agrofood Cluster - CAT.AL: Bio-based Chemicals	PP10 (Lombardy)
Assolombarda: Bio-based Chemicals	PP10 (Lombardy)
National Federation of Chemical Industry - Federchimica: Bio-based Chemicals	PP10 (Lombardy)

Lombardy Green Chemistry Cluster - LGCA: Bio-based Chemicals	PP10 (Lombardy)
Smart cities and communities: Bio-based Chemicals	PP10 (Lombardy)
SPRING - Cluster Tecnologico Nazionale della Chimica Verde: Bio-based Chemicals	PP10 (Lombardy)
Confindustria Lombardia: Bio-based Chemicals	PP10 (Lombardy)
Cleantech-Cluster: Bio-based Chemicals	PP2 (Oberösterreich)
Plastics Cluster: Bio-based Chemicals	PP2 (Oberösterreich)
Confindustria Trento: Bio-based Chemicals	PP8 (Provincia Autonoma di Trento)
Manufacturing of Bio-polymers value chains	
Poly4Eml: Manufacturing of Bio-polymers	PP4 (Slovenia)
Novachim: Manufacturing of Bio-polymers	PP12 (Auvergne-Rhône-Alpes)
Plastipolis: Manufacturing of Bio-polymers	PP11 (Auvergne-Rhône-Alpes)
Vegepolys Valley: Manufacturing of Bio-polymers	PP12 (Auvergne-Rhône-Alpes)
AFBW Allianz Faserbasierte Werkstoffe: Manufacturing of Bio-polymers	PP7 (Baden-Württemberg)
AFBW Allianz Faserbasierte Werkstoffe: Manufacturing of Bio-polymers	PP9 (Baden-Württemberg)
INNONET Kunststoff: Manufacturing of Bio-polymers	PP9 (Baden-Württemberg)
Chemie-Cluster Bayern GmbH: Manufacturing of Bio-polymers	PP14 (Bavaria)
Cluster Forst und Holz in Bayern: Manufacturing of Bio-polymers	PP14 (Bavaria)
Cluster Ernährung: Manufacturing of Bio-polymers	PP14 (Bavaria)
Cluster Neue Werkstoffe c/o Bayern Innovativ: Manufacturing of Bio-polymers	PP14 (Bavaria)
BioCampus Straubing GmbH: Manufacturing of Bio-polymers	PP14 (Bavaria)
Zentrum für Lebensmittel- und Verpackungstechnologie e.V.: Manufacturing of Bio-polymers	PP14 (Bavaria)
Swiss Plastics Cluster: Manufacturing of Bio-polymers	Lead (Canton de Fribourg)
Lombardy Green Chemistry Cluster - LGCA: Manufacturing of Bio-polymers	PP10 (Lombardia)
SPRING - Cluster Tecnologico Nazionale della Chimica Verde: Manufacturing of Bio-polymers	PP10 (Lombardia)
Plastics Cluster: Manufacturing of Bio-polymers	PP2 (Oberösterreich)
Confindustria Trento: Manufacturing of Bio-polymers	PP8 (Provincia Autonoma di Trento)
Eco-construction value chains	
Wood Industry Cluster: Eco-Construction	PP4 (Slovenia)
Holzkette Schwarzwald e.V.: Eco-Construction	PP7 (Baden-Württemberg)
RegioHOLZ BW: Eco-Construction	PP9 (Baden-Württemberg)
INNONET Kunststoff: Eco-Construction	PP9 (Baden-Württemberg)
Cluster Forst und Holz in Bayern: Eco-Construction	PP14 (Bavaria)
Cluster Ernährung: Eco-Construction	PP14 (Bavaria)
BioCampus Straubing GmbH: Eco-Construction	PP14 (Bavaria)
Zentrum für Lebensmittel- und Verpackungstechnologie e.V.: Eco-Construction	PP14 (Bavaria)
Umweltcluster Bayern: Eco-Construction	PP14 (Bavaria)
Chemie-Cluster Bayern GmbH: Eco-Construction	PP14 (Bavaria)
Waldschweiz: Wood	Lead (Canton de Fribourg)
Lombardy Energy Cleantech Cluster - LE2C: Eco-Construction	PP6 (Lombardia)
Furniture and Timber Construction Cluster: Eco-Construction	PP2 (Upper Austria)
Cleantech-Cluster: Eco-Construction	PP2 (Upper Austria)
Commerce Chamber - Wood: Eco-Construction	PP8 (Provincia Autonoma di Trento)
Habitech: Eco-Construction	PP8 (Provincia Autonoma di Trento)
Progetto Manifattura: Eco-Construction	PP8 (Provincia Autonoma di Trento)
Confindustria Trento: Eco-Construction	PP8 (Provincia Autonoma di Trento)
FederlegnoArredo - Trentino and South Tyrol: Eco-Construction	PP5 (Provincia Autonoma di Trento)

Furniture value chains	
Wood Industry Cluster: Furniture	PP4 (Slovenia)
Plastipolis: Furniture	PP11 (Auvergne-Rhône-Alpes)
Netzwerk Holzindustrie Baden-Württemberg e.V.: Furniture	PP9 (Baden-Württemberg)
proHolz Schwarzwald: Furniture	PP9 (Baden-Württemberg)
Cluster Forst und Holz in Bayern: Furniture	PP14 (Bayern)
Cluster Ernährung : Furniture	PP14 (Bayern)
BioCampus Straubing GmbH: Furniture	PP14 (Bayern)
Zentrum für Lebensmittel- und Verpackungstechnologie e.V.: Furniture	PP14 (Bayern)
Chemie-Cluster Bayern GmbH: Furniture	PP14 (Bayern)
FederlegnoArredo - Lombardia: Furniture	PP10 (Lombardia)
National Federation of Chemical Industry - Federchimica: Furniture	PP10 (Lombardia)
Lombardy Green Chemistry Cluster - LGCA: Furniture	PP10 (Lombardia)
SPRING - Cluster Tecnologico Nazionale della Chimica Verde: Furniture	PP10 (Lombardia)
Furniture and Timber Construction Cluster: Furniture	PP2 (Upper Austria)
Commerce Chamber - Wood: Furniture	PP8 (Provincia Autonoma di Trento)
FederlegnoArredo - Trentino and South Tyrol: Furniture	PP5 (Provincia Autonoma di Trento)
Food production value chains	
Poly4Eml: Food production	PP4 (Slovenia)
SRIP HRANA: Food production	PP13 (Slovenia)
Vegepolys Valley: Food production	PP12 (Auvergne-Rhône-Alpes)
food.net:z – Lebensmittelnetzwerk Rhein-Neckar e.V.: Food production	PP7 (Baden-Württemberg)
Cluster Ernährung: Food production	PP14 (Bayern)
Cluster Neue Werkstoffe c/o Bayern Innovativ: Food production	PP14 (Bayern)
BioCampus Straubing GmbH: Food production	PP14 (Bayern)
Zentrum für Lebensmittel- und Verpackungstechnologie e.V.: Food production	PP14 (Bayern)
Umweltcluster Bayern: Food production	PP14 (Bayern)
Chemie-Cluster Bayern GmbH: Food production	PP14 (Bayern)
Schweizer Bauernverband: Food production	Lead (Canton de Fribourg)
SwissOlio Genossenschaft - Verband Schweizerischer Hersteller von Speiseölen, Speisefetten und Margarinen: Food production	Lead (Canton de Fribourg)
Schweizerischer Bäcker-Confiseurmeisterverband: Food production	Lead (Canton de Fribourg)
Cluster Food & Nutrition: Food production	Lead (Canton de Fribourg)
Lombardy High Tech Agrofood Cluster - CAT.AL: Food production	PP10 (Lombardia)
Assolombarda: Food production	PP10 (Lombardia)
Lombardy Green Chemistry Cluster - LGCA: Food production	PP10 (Lombardia)
Confindustria Trento: Food production	PP8 (Provincia Autonoma di Trento)
Polo di Innovazione Agroalimentare: Food production Piedmont	PP5 (Provincia Autonoma di Trento)
Energy value chains	
Plastipolis: Energy	PP11 (Auvergne-Rhône-Alpes)
Novachim: Energy	PP12 (Auvergne-Rhône-Alpes)
Cluster Forst und Holz in Bayern: Energy	PP14 (Bayern)
BioCampus Straubing GmbH: Energy	PP14 (Bayern)
Umweltcluster Bayern: Energy	PP14 (Bayern)
Schweizer Bauernverband: Energy	Lead (Canton de Fribourg)
SwissOlio Genossenschaft - Verband Schweizerischer Hersteller von Speiseölen, Speisefetten und Margarinen: Energy	Lead (Canton de Fribourg)
Assolombarda: Energy	PP10 (Lombardia)
National Federation of Chemical Industry - Federchimica: Energy	PP10 (Lombardia)

Lombardy Green Chemistry Cluster - LGCA: Energy	PP10 (Lombardia)
SPRING - Cluster Tecnologico Nazionale della Chimica Verde: Energy	PP10 (Lombardia)
Lombardy Energy Cleantech Cluster - LE2C: Energy	PP6 (Lombardia)
Cleantech-Cluster: Energy	PP2 (Upper Austria)
Pharma, Fragrance, Cosmetics value chains	
Vegepolys Valley: Pharma, Fragrance, Cosmetics	PP12 (Auvergne-Rhône-Alpes)
Novachim: Pharma, Fragrance, Cosmetics	PP12 (Auvergne-Rhône-Alpes)
Chemie und Pharma am Hochrhein: Pharma, Fragrance, Cosmetics	PP9 (Baden-Württemberg)
Chemie-Cluster Bayern GmbH: Pharma, Fragrance, Cosmetics	PP14 (Bayern)
Cluster Forst und Holz in Bayern: Pharma, Fragrance, Cosmetics	PP14 (Bayern)
Cluster Ernährung : Pharma, Fragrance, Cosmetics	PP14 (Bayern)
Cluster Neue Werkstoffe c/o Bayern Innovativ: Pharma, Fragrance, Cosmetics	PP14 (Bayern)
BioCampus Straubing GmbH: Pharma, Fragrance, Cosmetics	PP14 (Bayern)
Zentrum für Lebensmittel- und Verpackungstechnologie e.V.: Pharma, Fragrance, Cosmetics	PP14 (Bayern)
Umweltcluster Bayern: Pharma, Fragrance, Cosmetics	PP14 (Bayern)
PhytoArk: Pharma, Fragrance, Cosmetics	Lead (Canton de Fribourg)
Schweizerischer Drogistenverband: Pharma, Fragrance, Cosmetics	Lead (Canton de Fribourg)
Lombardy High Tech Agrofood Cluster - CAT.AL: Pharma, Fragrance, Cosmetics	PP10 (Lombardia)
Assolombarda: Pharma, Fragrance, Cosmetics	PP10 (Lombardia)
National Federation of Chemical Industry - Federchimica: Pharma, Fragrance, Cosmetics	PP10 (Lombardia)
Lombardy Green Chemistry Cluster - LGCA: Pharma, Fragrance, Cosmetics	PP10 (Lombardia)
Proposed specific value chains by project partners	
Packaging Excellence Region Stuttgart (packaging activities, mainly machinery)	PP7 (Baden-Württemberg)
Cleantech-Cluster: Beer brewing	PP2 (Upper Austria)
Cleantech-Cluster: Chipping Process	PP2 (Upper Austria)
Cleantech-Cluster: Composting	PP2 (Upper Austria)

Source: Web Interface database December 2019

AlpLinkBioEco Partners



AlpLinkBioEco develops

1. Database to map existing resources, actors and relevant policies in the Alpine Space
2. Methodology to match actors for new value chains
3. New (cross)-regional value chains
4. Policy recommendations for the development of bioeconomy in the Alpine Space

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