Interreg

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Alpine Space

INNOBIOVC

# REPORT

## Deliverable D.1.2.1


### Summary

This report provides insight and feedback from the arranged training workshops for the project partners and regional stakeholders.



Version 0.1, 20/12/2023


## DELIVERABLE DESCRIPTION

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| **DELIVERABLE:**<br>D.1.2.1 Report |
| **WORK PACKAGE:**<br>WP1. Rolling-out the enhanced Innovation Express Scheme for establishing cross-regional value chains<br>ACTIVITY 1.2:<br>Anteja provides methodology and trainings to use VCG |
| **AUTHOR(S):**<br>Mateja Dermastia, Miha Škrokov, Jon Goriup |
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| **COORDINATOR:**<br>Wirtschaftsförderung Raum Heilbronn GmbH |

### Quality of information

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| Version | Date | Modified by | Comments |
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| Final | 27/12/2023 | | |

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| B2B | Business to Business |
| BizUP | Business Upper Austria |
| CBE | Circular Bioeconomy |
| IE 2024 | Innovation Express 2024 |
| IECS | Innovation Express Call Scheme |
| LGCA | Lombardy Green Chemistry Association |
| PLA | Polylactic Acid |
| SAT | Sustainability Assessment Tool |
| S3 | Smart Specialization Strategy |
| TRL | Technology Readiness Level |
| VCG | Value Chain Generator |
| VCG.AI | Value Chain Generator AI |



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# EXECUTIVE SUMMARY

The potential for unlocking the circular bioeconomy is primarily determined by the possibility of building **value chains** that connect all players, such as primary producers, suppliers of biomass and renewable by-product conversion technologies, brand owners, regulatory and certification agencies. These value chains can only be visible through the data collection of all project regions and data.

The INNOBIOVC report, Deliverable D.1.2.1, provides project partners with an overview of the training workshops which were conducted. The Value Chain Generator (VCG) provides input for discussions with project partners on strategies and findings related to fostering a circular bioeconomy in participating regions.

Training workshops were conducted with Business Upper Austria, Innovation Salzburg, Lombardy Green Chemistry Association, WFG Heilbronn and Chemie Cluster Bayern. These workshops aimed to define the scope of the Innovation Express 2024 (IE 2024) call, identify promising value chains, and pinpoint key stakeholders.

- In Salzburg, discussions focused on the critical mass of food companies and the need for processing facilities for fermentation to support the circular bioeconomy in Upper Austria.
- In Lombardy, the LGCA cluster's technological capacity was highlighted, emphasizing the need for collaboration with food and beverage companies for biomass supply.
- In Heilbronn, the workshop was focused on circular economy ecosystem which include also automotive, machinery and plastics industries.
- In Bayern, the workshop was focused on mapping most relevant regional waste streams, specifically focusing on waste management and water treatment



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# 1.INTRODUCTION TO THE VALUE CHAIN GENERATOR

The Value chain generator utilizes the cutting edge BioLink® algorithm to define technologically sound and commercially viable circular value chains and business models for the regions and clusters.

**Value Chain Generator (VCG) A Pathway to Circularity and Profitability**
VCG leverages AI and big data Biolink® model, to repurpose industrial residuals into valuable resources and products. VCG not only enhances the profitability of companies in the region, but also aligns with climate targets by fostering a transition towards a circular economy.

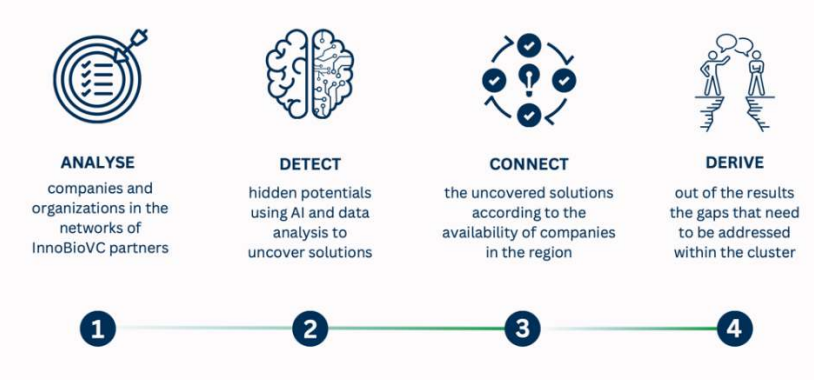
**Creating High-Demand Products from Waste**
By matching companies based on their resource needs and residuals, VCG facilitates the creation of in-demand market products. It offers technical solutions and fosters business partnerships that reduce waste treatment costs, generate new revenue streams, and improve overall profitability. Simultaneously, it contributes to the reduction of CO2 emissions and the conservation of land and freshwater resources.

**Empowering Regional Development Agencies, Clusters, and Chambers**
VCG serves regional development agencies, clusters, and chambers in their effort to accelerating the adoption of circular economy practices among their members. It enables the exploration and development of viable solutions and concrete partnerships for projects and investments. Additionally, VCG promotes knowledge transfer across projects and initiatives, facilitating best practice sharing and expediting the transition to a circular economy while leveraging European-developed technologies.

# 2. METHODOLOGY TO USE THE VALUE CHAIN GENERATOR

**The Value Chain Generator analysis of circular solutions for INNOBIOVC partners**.

Figure 1: VCG methodology





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- **Clusters Company Analysis:** Analyzing firm level capacity for engagement in the circular value chains from the supply, technology, and market potential aspects.
- **Potential Detection:** Identify hidden cross sectoral opportunities for circular solutions within InnoBioVC partners regions.
- **Solution Connection:** Connect concrete companies in technical and business viable solutions.
- **Define partnerships for projects and investments:** It identifies the gaps that need to be addressed by the region and cluster, such as missing companies or the lack of supply, markets, or technologies. It provides lists of potential cross regional partnerships for closing the gaps.

# 3. TRAINING WORKSHOPS IN THE REGIONS

Anteja conducted four training workshops with InnoBIoVC partners, namely Business Upper Austria, Lombardy Green Chemistry Association, and WFG Heilbronn. Additionally, the fourth workshop was conducted with the Chemie Cluster Bayern. The workshop with Upper Austria also included Innovation Salzburg.

These sessions were crafted to assist partners in defining the scope of the IE 2024 call, identifying the most promising value chains, and pinpointing the key stakeholders integral to the development of these value chains. The primary objective of each of these workshops was to explore potential circular value chains within the context of the IE 2024 initiative. This exploration involved identifying gaps within these chains and the key actors necessary to foster cross-regional cooperation. Such cooperation is crucial to bridge these gaps and stimulate the growth of the circular bioeconomy sector, extending from the Alpine Space and beyond.

This collaborative approach helped regional development agencies and clusters understand how to use the Value Chain Generator to define circular value chains that are technically and commercially viable for their members/regional companies. The structure of the workshops promoted active participation and open discussion. The workshop agendas covered the following range of pertinent topics:

1. Workshop Scope Overview
2. Presentation on Circular Economy Value Chain Analysis, VCG.AI
3. Identifying Viable Circular Value Chains for IE 2024: Discussion on Gaps and Obstacles
4. Defining Topics and Scope for IE 2024.

The key findings from the four workshops are presented below.


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## 3.1 WORKSHOP IN SALZBURG, AUSTRIA, WITH BIZ-UP AND SALZBURG INNOVATION

In Salzburg the workshop was conducted on the 22nd of November. Luise Dauwa (BizUp), Madeleine Koch, Romana Schwab, Werner Balika, and Christoph Moosbauer (and Innovation Salzburg) participated.

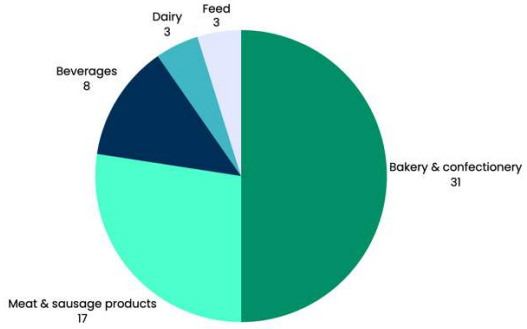
**Four value chains were disused based on the BizUP Food cluster options that link supply (residuals, byproducts, and organic waste), technology (process), and market applications (market demand):**

- Bakery organic waste to organic acids - (fermentation)
- Spent grain to plant- based meat (Biofractionation)
- Whey to protein ingredients - (Ingredients Extraction)
- Animal Feed as off taker - biowaste to Protein Products (Insect Farming).

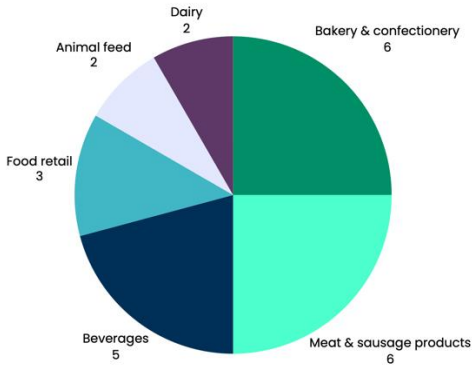
The discussion emphasized the circular options of food companies in the region, particularly those in the bakery, meat and sausage, dairy, and beverage industries. These companies face pressure, which is primarily associated with costs of treatment and disposals of residuals, by-products, and waste they generate.

*Figure 2: Structure of the food cluster Upper Austria*

*Structure of the food clusters by sectors*




*Breakdown of companies by size*




**The workshop equipped participants with hands-on experience in leveraging the value chain generator tool**. They learned to analyze regional and cluster-level data, explore circularity, and set priorities. The skills acquired enable participants to devise and execute strategies that minimize environmental impacts while boosting regional competitiveness.


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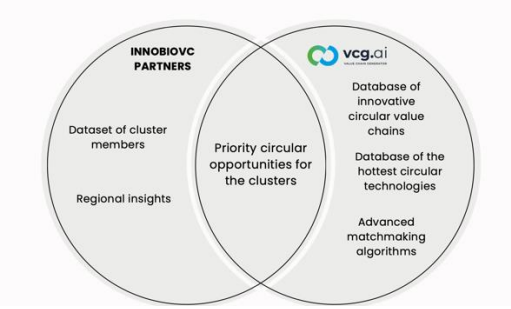
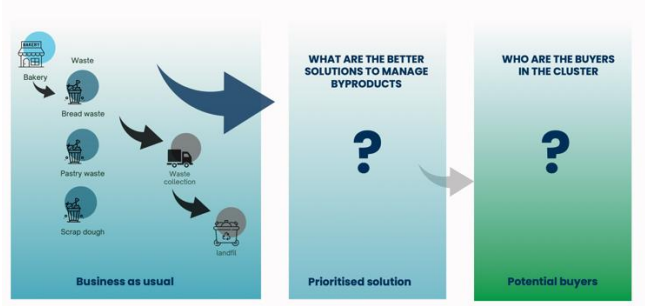
*Figure 3: VCG Enhancing Regional Competitiveness and Environmental Sustainability*

*Use of Value chain generator*




*Linear vs Circular*






**The discussion's third focal point was the integration of advanced technologies to foster a circular bioeconomy.** Specifically, members of the Food Cluster could ensure a consistent flow of residuals which are a source of biomass for fermentation processes and lactic acid production. Pharmaceutical companies in Upper Austria stand to gain from locally produced organic acids. However, the region currently lacks the necessary processing facilities for fermentation. To bridge this gap, two strategic approaches were proposed:

- Forming Alliances: Engaging with technology providers from neighboring regions
- Regional Technology Development: This strategy requires a thorough assessment of the time, financial investment, and involvement of key stakeholders capable of delivering market-ready technologies promptly.

In any case the deployment of fermentation technology would establish a regional infrastructure that supports the circular bioeconomy, aligning with the broader goals of sustainable development and resource efficiency.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## 3.2 WORKSHOP IN LOMBARDY, ITALY, WITH THE LOMBARDY GREEN CHEMISTRY ASSOCIATION (LGCA)

The discussion with the LGCA included several meetings which addressed the technological potential of the cluster. Ilaria Re, Sara Daniotti, and Martina Galiotto participated. The final discussion was held online on the 29th of November 2023.

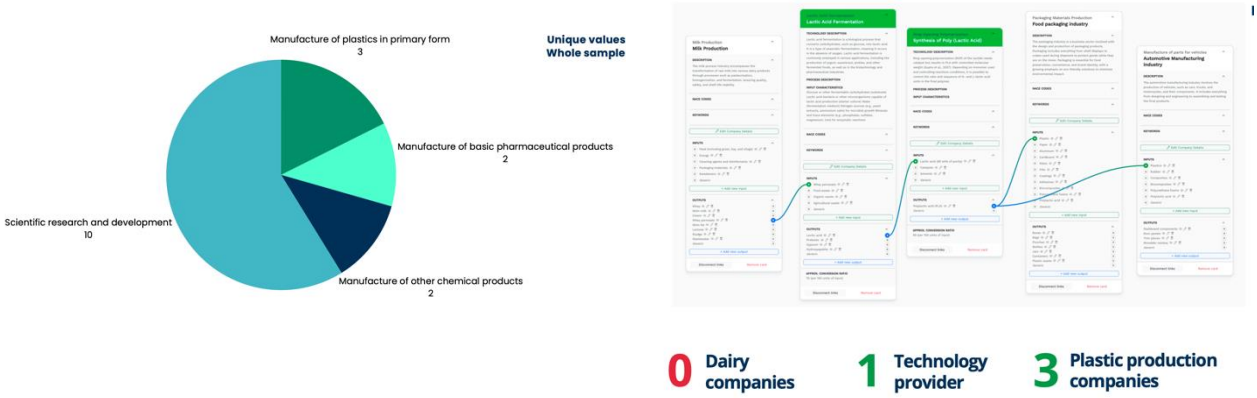
LGCA can participate in various value chains due to their strong technology base. Three options were defined as the drivers for IE 2024:

- Plastics Manufacturing, Lactic acid fermentation
- Manufacturing of Pharmaceuticals, Organic acid production
- Manufacturing of Other Chemical Products, Algaculture production.

The discussion underscored the pivotal role of scientific research and development within the LGCA cluster. This cluster engages in the manufacturing of primary form plastics, basic pharmaceutical products, and other chemical products. The structure of LGCA highlights the cluster's technological capacity, which forms the building blocks of the bioeconomy.

The discussion also emphasized the need for collaboration with companies in the food and beverage industry. These companies can provide biomass or secondary biomass for production facilities. Furthermore, the discussion revealed that there are several dairy and other food and beverage companies in the region and across Alpine Space that can benefit from the technology developed by LGCA cluster members.

*Figure 4: Structure of the LGCA company's data set and define gap in circular value chain*



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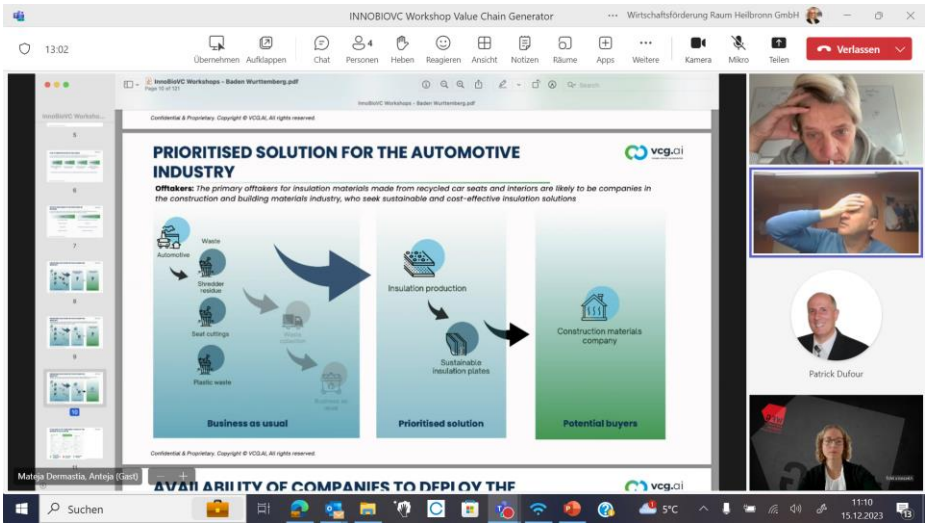
## 3.3 WORKSHOP IN HEILBRONN, GERMANY, WITH WFG HEILBRONN

In Heilbronn the workshop was conducted virtually on the 15th of December. Alexandra Wolf, Patrick Dufour and the InnoBioVC Advisory Board Members Andreas Reichert and Dr. Meier Zu Koëker joined the meeting.

The value chain generator underscores the role of advanced technologies and regional industrial structure in shaping a circular, cross-sector industry in Alpine Space. This combination makes the most of bio-based residues and by-products and produces high-value products that are already in high demand and experiencing growth.

The workshop discussed several options:

- Motor Vehicle, Insulation production from automotive interior seat waste
- Manufacturing Plastic Product, Lactic acid fermentation from the dairy industry
- Winemaking Dairy processing, Organic Waste to Biochar
- Dairy Industry, Whey to protein ingredients - (Ingredients Extraction).




**Key takeaways:**

The Value Chain Generator provided Heilbronn with strategies for a circular bioeconomy in the context of Baden Wurttemberg. These strategies explored the complex structure of circular bioeconomy value chains that span multiple sectors such as agriculture, food and beverages, chemicals, pharmaceuticals, and also construction, automotive, and machinery. This complexity of interactions transcends the boundaries of industrial clusters and also regional capacities. It is also limited with the circular bioeconomy, which emphasizes in particular the use of biomass. Discussions pointed to directions of not to limit Innovation Express Call to “traditional bio sectors” and open to wider scope of sectors and clusters that contribute to effective carbon management practices.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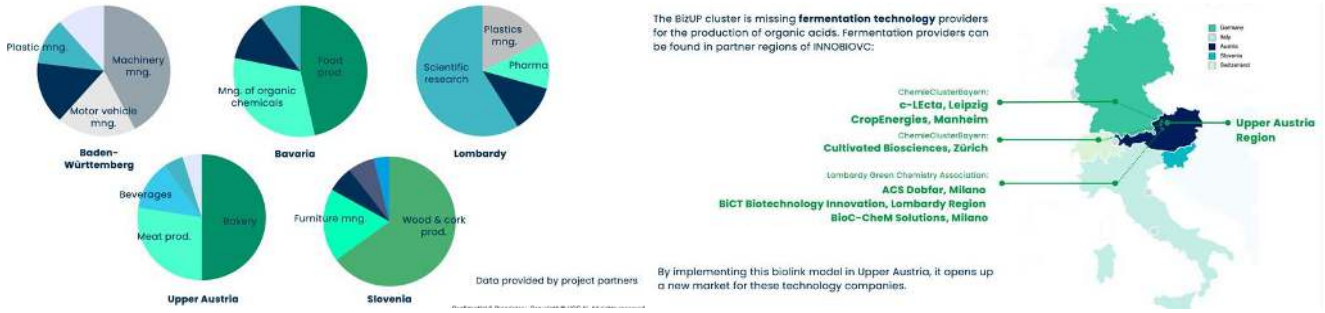
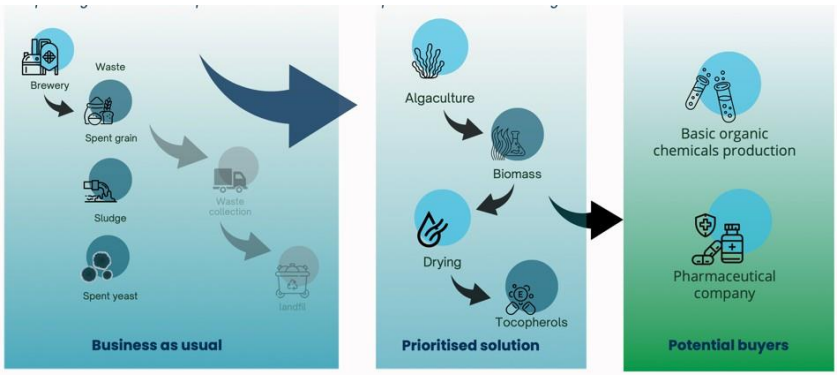
## 3.4 WORKSHOP WITH CHEMIE CLUSTER BAYERN

The workshop was conducted with wider set of regions with aim to also promote circular economy in Central Europe on 14 December 2023. Besides Chemie Cluster Bayern (DE), National Institute of Chemistry (SI), Fraunhofer Italia (IT), University of Warmia and Mazury in Olsztyn (PL), Kujawsko-Pomorskie Voivodeship (PL), Carinthia UAS (AU), Slovak University of Agriculture in Nitra (SK) participated.

The Value Chain Generator was showcased, highlighting the potential for other regions to validate the technologies they are developing in real-world environments through the use of VCG. The discussion also covered options for identifying the availability of residuals in specific locations that can be transformed through technology, as well as markets for newly valorized materials.




The participants discussed options for engaging in activities and decided to further utilize the Value Chain Generator to expand matchmaking opportunities across the Alpine Space and Central Europe in circular value chains. This includes mapping regional waste streams most relevant to the technology solutions they are working on, specifically focusing on waste management and water treatment.

# 4. CONCLUSIONS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The findings and conclusions are:

1. The VCG has provided InnoBioVC partners with technically and economically viable options for a circular bioeconomy in Alpine Space.

2. The VCG underscores the role of advanced technologies and regional industrial structures for shaping a circular industry that crosses sectors. These combinations make the most of bio-based residuals (all generated in Alpine Space), and produce high-value products which are already in high-demand and experiencing growth. These findings bring to light the vast expanse of the circular bioeconomy, which covers a wide array of sectors from agriculture, food, and beverages, to chemicals, pharmaceuticals, construction, automotive, and machinery (all strong in Alpine Space).

3. Circular bioeconomy is cross sectorial. Analysis pointed out that circular bioeconomy options transcends the boundaries of (bio)industrial clusters and regional capacities and span multiple sectors such as agriculture, food and beverages, chemicals, pharmaceuticals, and also construction, automotive, and machinery. This will be further elaborated upon in the Deliverable 1.2.2 Good Practice and Lessons Learned report.


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