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Cradle-ALP

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D.2.2.2

Applying and testing the C2C industrial transformation roadmap in the selected industrial sectors

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Task n°:	**A2.2**
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Summary

The Cradle-ALP project aims to support small and medium-sized enterprises (SMEs) in the Alpine region in shifting from linear production systems to circular value chains based on the Cradle-to-Cradle idea. In previous work packages, sector-specific transformation roadmaps (chemicals, polymers, packaging, textiles, wood/furniture) and a practical toolbox were developed. Work package A2.2 (Deliverable D2.2.2) focused on testing how these instruments can be applied in practice and how effectively they support SMEs in their transition toward circular business models.

The project partners implemented a mix of collective and individual support activities. Tools included the QuickScan Circular Business Models, Sustainable Business Model Canvas, Maturity Assessment, Circularity Compass, Life Cycle Assessment (LCA) with an accompanying guide, Lego Serious Play workshops, the Value Chain Generator, as well as matchmaking events and company visits. The goal was to give SMEs a structured entry point and strategic guidance, initiate collaborations, and connect technological expertise across regions.

In total, more than 250 companies and research organizations took part in these activities. Several matchmaking events resulted in new partnerships, such as the collaboration between Rottal Hanf and Grüne Erde on using regional hemp fibers. LCA workshops across different countries introduced SMEs to life cycle assessment methods and encouraged more sustainable product design. Lego Serious Play workshops helped participants tackle complex challenges creatively, for example by designing regional circular value chains for sustainable plastic packaging. In parallel, the project partners supported numerous SMEs individually in applying the tools, developing circular business models, and accessing new markets.

The results show that direct, personal support combined with network-based formats is particularly effective in engaging SMEs. Start-ups and young companies benefited the most, as they are often more flexible to adopt new business models, while established companies were more hesitant due to higher internal effort and resource requirements.

Overall, the project demonstrates that there is a strong interest in circular and sustainable approaches which are seen as economically relevant in the Alpine region, but its large-scale implementation requires targeted support, suitable incentive systems, and stronger policy backing. The activities carried out so far have laid the groundwork for cross-sectoral networks that can accelerate the transition to circular value chains in the future.

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Contents

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1. Introduction to the Cradle-Alp project

Cradle-ALP aims for mainstreaming cradle to cradle (C2C) approaches, circular design and circular substitutions (from the alpine region) for linear products in industrial processes, in different industrial sectors. The Alpine Space has many natural resources and the technologies to substitute fossil raw materials and toxic substances from production with circular and environmentally friendly alternatives. This should lead to the fact that materials and products can be led back into a healthy cycle after use. The focus of this project shall be on the substitution of chemical and fossil based/unsustainable materials with more circular, sustainable and bio-degradable ones.

In a first step, the partners addressed the public, relevant industries and stakeholders from policy and innovation intermediaries to build broad awareness and understanding for the opportunities and challenges of the transformation towards circular value chains. This comprises the future manufacturing of industrial products by means of C2C approaches, using circular design principles and substituting conventional materials with renewable alternatives.

Building on a thorough multidimensional (technology, policy, economy, etc.) roadmapping exercise, transnational groupings of stakeholders developed roadmaps for each of the five focus sectors including chemistry, polymers, packaging, textile and furniture/wood-based materials. These transformation roadmaps give guidance to SMEs for current and future technological, regulatory and economical aspects on the way to transform their industrial value chain.

Based on this information the consortium partners will test different service offers and tools to support SMEs implementing C2C approaches, circular design and circular substitutions along their specific value chains.

Finally, the partners will work towards ensuring a transnational policy convergence towards transnational S4 strategies in the priority sectors of the project and initiate common cross border funding instruments for the industrial C2C transformation.

2. Definition of the objective

The objective of task A2.2 is to test the relevance of the transformation roadmap and the C2C toolbox to directly support SMEs in their transformation efforts to build circular value chains.

Through transnational as well as local and collective as well as individual activities, project partners provided support to SMEs in the Alpine space region. Their role includes mentoring SMEs, assisting in technology adoption, and facilitating collaboration between businesses to establish new value chains.

3. Tools used for pilot activities to promote C2C in industrial sectors

In the previous work packages the consortium partners discussed and worked on different tools to be used for supporting SMEs in their effort to take steps towards circular

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economy and to transform their production processes and/or business models to a circular, more sustainable system.

These tools are briefly summarized in the following section.

- **Sustainable Business Model Canvas & Maturity Assessment**

  A Sustainable Business Model Canvas (SBMC) is an adaptation of the traditional Business Model Canvas (BMC) that integrates environmental and social considerations into the core strategy of a business. It helps organizations design, assess, and iterate their business models with sustainability as a primary focus. The purpose of the traditional BMC is to map out the essential components of a business and how they interact to create value. The purpose of a SBMC is to embed sustainability into the business model, ensuring that the company creates value not just economically, but also socially and environmentally. The SMBC offers a versatile framework that can be applied across various contexts to integrate sustainability into core business strategies. Whether for startups, established enterprises, non-profits, or public sector initiatives, the SBMC helps organizations design models that are economically viable, socially responsible, and environmentally sound.

  Maturity Assessment Tools are instruments or methodologies used to evaluate how advanced or "mature" a specific organization, process, or system is. These tools provide a structured way to assess current capabilities and practices, often against a predefined model or set of criteria.

- **QuickScan Circular Business Models**

  The **Quick Scan** tool is designed to help businesses, particularly in the manufacturing sector, develop or refine circular business models. It provides a structured approach to assess an organization's current sustainability and circularity efforts, classify different circular business models, and guide companies in selecting strategies to transition towards circularity. The Quick Scan is a practical tool that enables companies to analyze their sustainability goals in about 30 minutes and offers actionable insights for adopting circular business practices.

- **Circularity Compass**

  The **Circularity Compass** is a strategic tool designed to help businesses and organizations map and visualize resource flows across different stages of a product's lifecycle. It is part of the **Circularity Thinking** framework developed by EIT Climate-KIC to support the transition toward a circular economy. The **Circularity Compass** is a practical and adaptable tool that helps businesses integrate sustainability into their core operations, making it easier to identify and implement circular economy strategies.

- **LCA guide & LCA Workshop**

  Life Cycle Assessment (LCA) is a standardized method used to evaluate the

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environmental impact of products, processes, or services throughout their entire lifecycle. This includes all stages, from raw material extraction, manufacturing, distribution, use, and disposal or recycling. LCA is widely used by businesses, policymakers, and researchers to develop sustainable products, meet regulations, and improve environmental performance. It is a powerful tool for informed decision-making in the transition toward a circular economy.

Since LCA is a complex method and many different consultants provide LCA services, the CradleAlp consortium provides a guide on the LCA method to give an overview. This guide is based on the master thesis of Magdalena Winkler, University of Applied Sciences Upper Austria Campus Wels.

- **Lego Serious Play Workshop**

  LEGO® SERIOUS PLAY® (LSP®) is an innovative facilitation method that uses LEGO bricks as a tool for problem-solving and creative thinking. The process helps participants to explore complex challenges and develop solutions through building, sharing, and reflecting on 3D models.

- **Value Chain Generator**

  The Value Chain Generator® (VCG) is a cloud-based AI platform designed to assist businesses in transforming organic by-products and waste into profitable assets. It identifies the most suitable organic residuals for value-adding transformations across various supply chains and regions. By evaluating and mitigating risks associated with each circular opportunity, VCG leverages global techno-economic and climate intelligence encompassing over 400 conversion technologies and business models. Additionally, it facilitates connections with appropriate supply chain partners and technology providers to ensure successful implementation of circular business models.

- **Online Match Making**

  Matchmaking events are structured networking gatherings designed to connect businesses, technology providers, and other stakeholders with shared interests. These events facilitate one-on-one meetings, enabling participants to explore potential collaborations, partnerships, and business opportunities. Matchmaking events serve as a strategic platform for SMEs to expand their networks, gain market insights, and foster partnerships that drive business growth and sustainability.

- **Direct Company Matching & Company Visits**

  Directly matching Small and Medium-sized Enterprises (SMEs) with solution providers can significantly enhance their efforts to develop sustainable value chains and explore new business opportunities. This collaboration enables SMEs to access specialized expertise, innovative technologies, and tailored strategies that address their unique challenges in sustainability. By partnering with solution providers, SMEs can implement efficient processes, reduce environmental impact,

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and meet evolving market demands for sustainable practices. Such partnerships not only improve operational efficiency but also open avenues for new products and services that align with sustainability goals.

Company site visits further support these objectives by allowing solution providers to gain a comprehensive understanding of an SME's operations, culture, and specific needs.

- **Joint Booth at Trade Fair/Conference**

SMEs of the Alpine Space were invited by the consortium partners to join the Cradle-ALP group booth and match making at the CIRPLEX - Circular Plastics Experience Summit in Klagenfurt, Austria. The joint Cradle-ALP booth and match making area organized by PP5 - BizUp allowed SMEs of the project regions to exhibit and showcase their products and technologies at this international conference. Finally, eight SMEs accompanied the project partners to be present at the Cradle-ALP group booth. This approach is particularly beneficial for Small and Medium-sized Enterprises (SMEs) aiming to maximize their presence while managing costs. SMEs benefit from enhanced visibility, affordable participation, little time for organization and networking opportunities. By participating in a joint booth, SMEs can effectively showcase their offerings, connect with key industry players, and gain valuable market exposure, all while optimizing costs and resources.

4. Report on Collective Activities

4.1. Match Making Events (Online/Onsite)

Building collaborations to develop circular value chains requires bringing interested companies together in order to discuss challenges and possible solutions. Through personal conversations SME representatives have the opportunity to learn about available technologies and possible solution providers. At the same time the SMEs can present their own solutions and products. Using the b2match tool, Cradle-ALP organized dedicated Match Making Events to stimulate the bilateral exchange.

Since PP8 Polymeris has already been using the professional and reliable platform tool of B2Match GmbH, Austria (https://www.b2match.com/) to host virtual match making events, the Cradle-ALP consortium agreed to keep this provider.

For every Match Making Event at least two consortium partners collaborated to organize the event. Wherever possible experts/scientists from BOKU University or HEIA-FR were involved to give a keynote presentation on a relevant technological or regulatory topic addressing circularity in the specific sector.

The match making events turned out to be very successful and valuable for connecting putative research, business and value chain partners. In total, 127 company representatives registered on the platform. Together with the project partners more than 130 people were active and used this platform for initial bilateral meetings and knowledge exchange. A total of 78 bilateral meetings were

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held online or onsite showing that this virtual tool is very helpful to bring organizations across regions and borders but sharing the same interest in circular economy and building novel circular value chains.

1. Match Making Event 'Composites Recycling in the Alpine Space'

Organizers: PP8, PP3, PP4
Sector focus/topic: Polymers/Composites, Chemistry
Date: March 20th, 2025, 10:00 – 16:00
Location: online

Agenda
Keynotes:
- 'Brief overview of the regulation framework on Composites recycling',
PD Dr. Florian Part, Institute of Waste Management and Circularity, BOKU University, Vienna
- Applicability of the Safe and Sustainable by Design (SSbD) principle for SMEs: benefits and challenges, **Christoph Olscher, Institute of Waste Management and Circularity, BOKU University, Vienna**
- 'Composites End-of-life management: challenges and solutions for SMEs', **Romain Agogué from IPC, Industrial Technical Center for Plastics and Composites**

SME Pitches:

- 'Closing the plastics loop – Challenges in CFRP Recycling',
  Robin Fachtan, Team Leader Polymers Composites & Injection Molding, Neue Materialien Bayreuth GmbH
- 'Decentralised mechanical recycling of composites waste', **Polyloop**
- 'Solvent-based process to reclaim high-quality, green, and affordable carbon fibre from composite waste', **Extracthive**
- 'Your Ultimate Guide to Efficient Contract Manufacturing and Materials Processing - Maximizing Material Processing Efficiency',
  Pablo Marroquín , CEO of Triangular

Online Match Making session:

Number of participants:
73 registered, 56 participants including speakers and Cradle-ALP partners

Type of participants:
Mainly SMEs (16), Business support organizations (14 including Cradle-ALP partners), Higher education and research organization (12) Startups (7), Large groups (3), Sectoral agency (1) and others (3)

Number of bilateral meetings:
There were 27 meetings scheduled and held on the platform following the conference, among which 18 were transnational. Moreover, 17 meetings were still pending and several participants which had pending meetings indicated to their Cradle-ALP partner that they scheduled the meeting later, outside the B2match platform, as the

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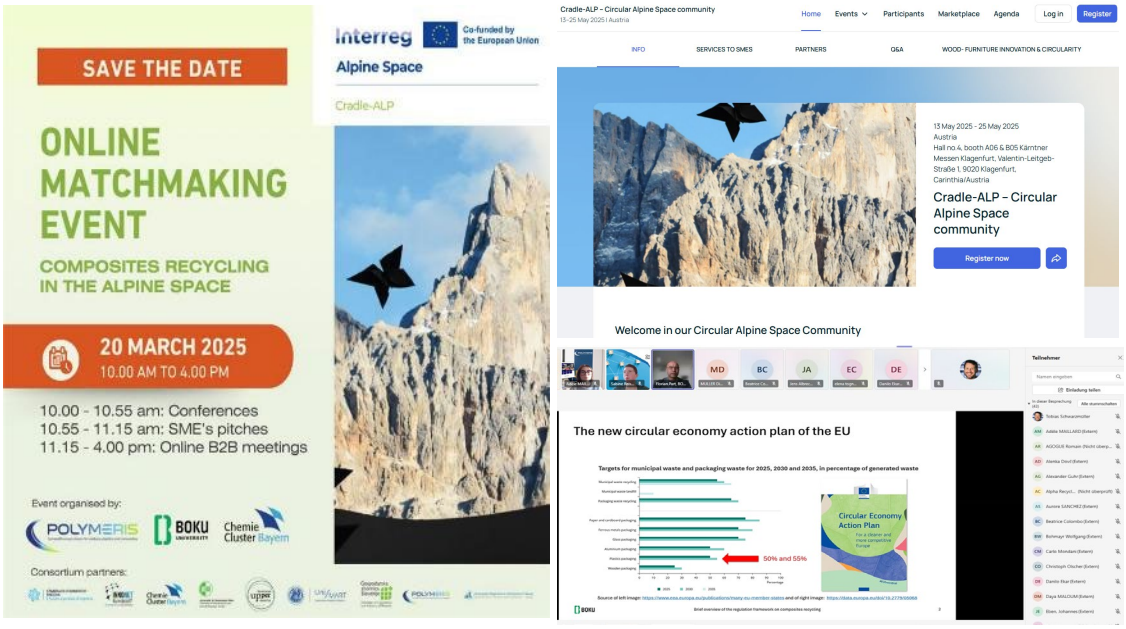
other participant was not available or had trouble with the tool.



Images: Screenshot of first online match making event

Outcome/Results:

Six meetings were rated as very to extremely interesting by the participants of the meeting and 4 meetings were rated as moderately interesting to very interesting by the meeting guest. Partners contacted the participating SMEs to follow-up on the event's impact.

From Polymeris network, 10 SMEs, 2 large groups and 1 technical centre participated in the event, Polymeris contacted the SMEs to discuss the meetings' results and potential collaborations implemented. Most of them were glad of their participation in the event

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and gathered information on technologies and political framework linked to the circularity of composites. 5 of them participated in the matchmaking meetings.

Polyloop, a French startup that develops compact, easy-to-use recycling units that can be installed directly at the sites of plastic processors, established a strategic connection with IPC, the French industrial technical center during the event. This relationship will lead to a joint carbon footprint study, carried out in partnership with EVEA, focused on the Polyloop recycling process. Further long-term collaborations on composite circularity are also being explored.

Extracthive, a French SME that recycles composite waste to produce carbon fibers made entirely from recovered materials, intended for semi-finished product manufacturers, had the opportunity to pitch its technology and generate interest from the audience. While discussions have not yet led to a concrete follow-up, the event significantly boosted the company's visibility within the Alpine region.

Plastic at Sea, a French SME with a world-leading laboratory for testing the toxicity and biodegradability of materials (polymers, metals, etc.) in aquatic and terrestrial environments, conducted six B2B meetings over the event and following days, including one with a Romanian research institute that led to a technical presentation to six researchers. Collaborative projects are currently under discussion. Additionally, a quotation was sent to GAINOPLAST for testing marine composting and biodegradability.

2. Match Making Event at CIRPLEX – Circular Plastics Experience Summit

Organizers: PP5 (involving all other partners)
Sector focus/topic: Packaging, plastics, recycling
Date: May 14-15th, 2025, 9:00 – 17:00
Location: onsite at CIRPLEX Summit in Klagenfurt, Austria

Number of participants:
97 registered, >40 CIRPLEX participants including 8 exhibiting SMEs of the joint Cradle-ALP booth and Cradle-ALP partners used the on-site meetings. The type of participants was not tracked.

Number of bilateral meetings:
49 meetings were scheduled. In fact, more meetings than scheduled were held since the Cradle-ALP matchmaking area was used also for ad hoc meetings.

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Images: Impressions of the Cradle-ALP joint booth at CIRPLEX conference

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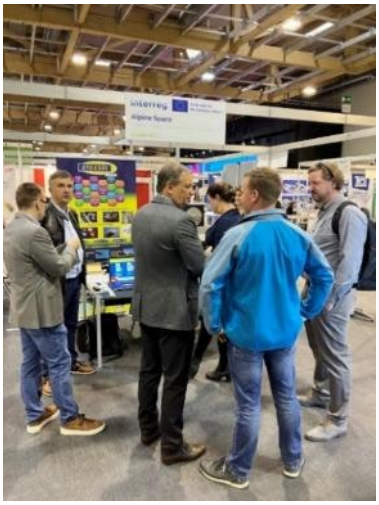
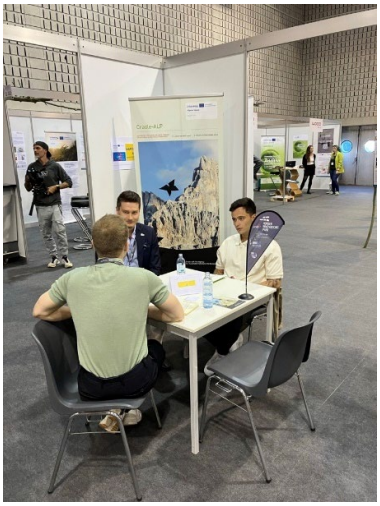



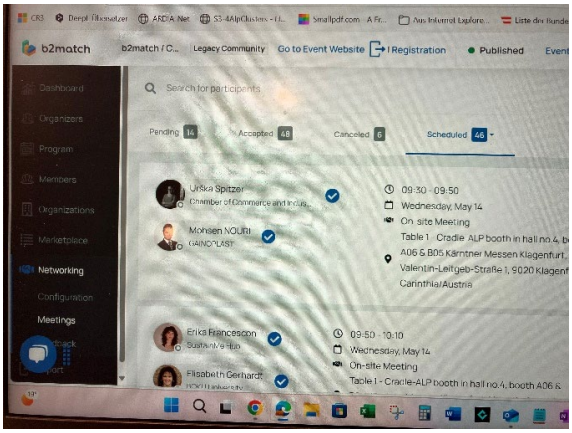

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Images: Impressions of theonsite Cradle-ALP match making and project presentation by Alenka Dovc, CCIS, on the main stage of CIRPLEX summit

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3. Match Making Event 'Wood-Furniture Innovation & Circularity'

Organizers: PP1 (involving all other partners)
Sector focus/topic: Wood/Furniture
Date: May 26th, 2025, 15:00 – 18:00
Location: online

Agenda
Welcome & Keynote:
- 'Welcome and overview of the contents of the day'
Andrea Galeota – CCIAA Padova
- 'Presentation of support services offered by Cradle-ALP partners'
Marco Galanti – Project Manager, t2i – Technology Transfer and Innovation

Pitches:
- 'Brief overview of the regulatory framework in the Wood-Furniture sector' **Alessandro Cibin – Fire Reaction Testing Laboratory, t2i**
- 'Design for Disassembly (DfD) and Modularity'
Dr. Erika Francescon – SustainMe Sustainability Consultancy Agency
- Surface treatment of reclaimed river wood, **Eva Tenan – MATECH R&D Materials Division & Federico Basso – 3B Sawmill – Altamateria**
- 'From Waste to Wonder: 3D-Printed Wood Closing the Loop of Circularity – The ProM Facility Experience'
Paolo Gregori – Trentino Sviluppo

Online Match Making session:
Online B2B meetings via the Cradle-ALP Circular Alpine Space community on the B2match platform.

Number of participants: 42 registered, >30 participated for the presentations. The type of participants was not tracked.

Number of bilateral meetings:
27 participants registered, 4 meetings scheduled between SMEs.

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4. Match Making Event 'Sustainability, Legislation and B2B Matchmaking in the Packaging Sector'

Organizers: PP7 (involving all other partners)
Sector focus/topic: Packaging
Date: June 13th, 2025, 9:00 – 15:00
Location: online

Agenda

Keynote presentations:

- 'Welcome and overview of the contents of the day'
Urška Spitzer, Senior Project Manager at Chamber of Commerce and Industry of Slovenia (SI)
- 'News and trends in sustainable packaging solutions: European legislation and standards'
Antonija Božič Cerar, Expert in European Environmental Legislation at Chamber of Commerce and Industry of Slovenia (SI)
- 'Driving optimization and innovation in sustainable supply chains with improved packaging solutions'
Igor Karlovits, Senior Packaging Expert at Danfoss Power Solutions (DK, SI)
- 'Gruber-Folien: Our Way to Circularity'
Marco Goette, Sustainability Manager at Gruber Folien (DE)

Online Match Making session:

Online B2B meetings via the Cradle-ALP Circular Alpine Space community on the B2match platform.

Number of participants:
18 registered, 19 participated, mainly SMEs and research organizations from Slovenia, Italy, Austria, Germany

Number of bilateral meetings:
5 meetings scheduled between SMEs.

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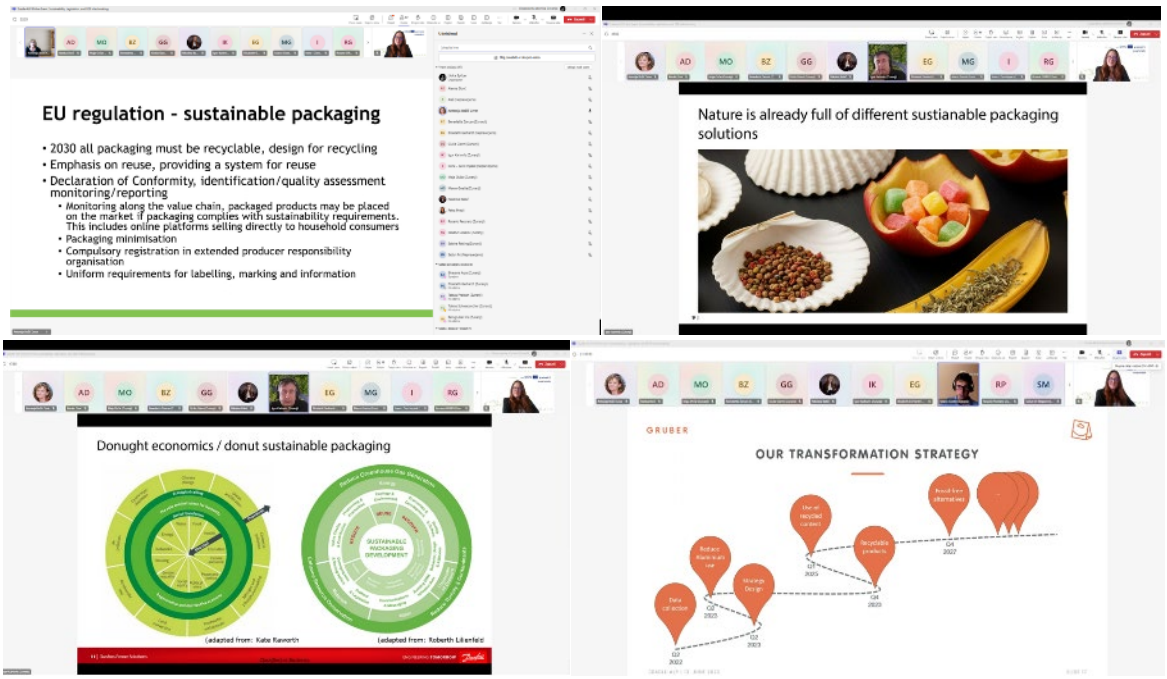
Outcome/Results:

The event provided SMEs with valuable access to expert knowledge and up to date information on European policies and legislation, directly supporting their efforts in product development and regulatory compliance. Participants also learned about more sustainable supply chains and got to know a good example / practical solution from a Bavarian Company Gruber Folien.

The event was also a good opportunity for first contacts and starting cooperation with partners from other Alpine countries. The B2match platform and the Cradle-ALP Circular Alpine Space community will stay open, so participants can still connect and plan meetings after the event. Overall, the event delivered excellent content and created meaningful connections, laying a strong foundation for future innovation and cooperation in sustainable packaging throughout the Alpine region.



Images: Screenshots of the matchmaking event

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4.2. Innovation Workshops – Lego Serious Play

LEGO® SERIOUS PLAY® (LSP®) is an innovative facilitation method that uses LEGO bricks as a tool for problem-solving and creative thinking. The process helps participants to explore complex challenges and develop solutions through building, sharing, and reflecting on 3D models.

1) Lego Serious Play - Closing the loop: Production of sustainable plastic packaging in the Alpine region

The Cradle-ALP partners PP5-BizUp and PP3-CCB used this innovation method for problem solving within the packaging value chain in regard to closing a recycling loop and sustainable plastic packaging within the Alpine region.

The workshop "Closing the loop: Production of sustainable plastic packaging in the Alpine region" was held on February 24th, 2025, in Linz/Austria, hosted by Business Upper Austria in collaboration with Chemie-Cluster Bayern. This cross-border initiative brought together SMEs and research institutions, focusing on advancing circular economy solutions for plastic packaging in the Alpine region.

Organizers: PP5 & PP3
Sector focus/topic: Packaging
Date: February 24th, 2025
Location: BizUp, Linz, Austria
Participants: 10

The workshop specifically addressed how the industry can become more circular, with a focus on establishing stable, regional value chains and identifying new cooperation opportunities. The workshop participants were addressed with the following two challenges and asked to develop putative solutions:

- What are the challenges for establishing a regional value chain for the production of sustainable plastic packaging?
- How can SMEs work together to master the challenges of sustainable plastic packaging?
- What are practical solutions to establish a stable regional value chain?

The following main findings were identified during the workshop:

Circular economy requires companies with various expertise along the value chain to collaborate. However, the communication is often slow and needs support. Industry clusters and networks can play a crucial role in facilitating these connections and fostering cross-sectoral partnerships within the Alpine region's plastic packaging value chain.

The workshop participants identified several key obstacles hindering circular economy implementation, including:

- Knowledge gaps: Lack of awareness about capabilities and expertise available

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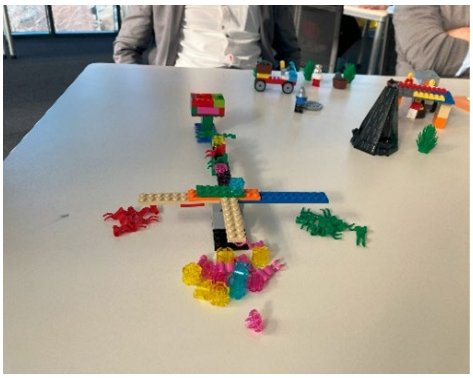
across different companies and sectors
- Bureaucratic and regulatory hurdles: Complex administrative processes when dealing with new technologies
- Bureaucratic and regulatory hurdles: Non-levelled playing field for companies in the circular economy compared to traditional linearly operating companies due to lack of incentives and regulatory hurdles
- Waste stream management: Regulatory challenges in handling materials classified as waste by-products
- International cooperation barriers: Complications in cross-border funding and collaboration processes

According to the participants a fundamental issue is inadequate communication that impedes effective collaboration. This communication gap is particularly problematic because,

- the transition to a circular economy cannot be achieved by individual companies working in isolation,
- the required expertise and capabilities are distributed across multiple organizations and sectors, and
- a successful implementation of a circular economy necessitates coordinated efforts from various stakeholders.

Implications for the Industry:

The workshop results emphasize that developing a circular economy in the sustainable plastics sector requires systematic improvement in inter-company and cross-sectoral communication, supported by effective networking structures and regulatory frameworks for international cooperation.



Images: Joint Bavarian-Austrian Lego Serious Play workshop on Feb 24th, 2025 in Linz/Austria

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2) Fischer Serious Play Workshop

Together with the company Fischer TZ Horb adapted the Lego Serious Play methodology on a specific innovation challenge of the Fischer: technical and advanced 3D modelling of clamping blocks. Referring to LSP it was named Fischer Serious Play and this tool was piloted with two diverse company teams of young talents.

Organizers: PP2-TZ Horb
Sector focus/topic: Materials & Polymers
Dates: May 7th & 22th, 2025
Location: DigitalHub, Horb, Germany
Participants: 20 & 24

The aim was to create business models for their new startup ideas, first using the sustainable business model canvas to clarify the needs and later targets, considering circular business strategies within the sector of materials and polymers.

The created prototypes were used for a Startups-pitch and the best team wins a slot at the startup-night northern black forest to present their idea to a professional audience.

Images: Fischer Serious Play workshop organized by TZ Horb at the Digital Hub, Horb

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4.3. LCA-Workshops

Life Cycle Assessment (LCA) is a systematic method for analyzing the potential environmental impacts of products or services throughout their entire life cycle. It encompasses all stages from raw material extraction to production, distribution, use, and end-of-life disposal. LCA helps to identify and quantify CO_2 emissions and other environmental impacts across a product's lifecycle, enabling targeted measures to reduce the overall ecological footprint. It provides data on environmental impacts, helping companies meet and exceed regulatory requirements. By using LCA, companies can make informed decisions about their environmental impact, improve their sustainability performance, and achieve their ecological goals.

However, performing a Life Cycle Assessment (LCA) has several significant challenges such as data availability and quality, complexity, methodological limitations as well as data aggregation and interpretation. There is often a lack of in-depth understanding and awareness of LCA among SMEs.

To inform about and train SMEs on the LCA methodology most Cradle-ALP partners organized expert workshops to provide first-hand knowledge about Life Cycle Assessment in general, the critical steps needed and different software solutions.

Next to the workshops participants also received the LCA guide 'A Beginner's Guide to Life Cycle Assessment' which was developed in a master thesis on behalf of PP5-BizUp. This LCA guide gives an overview on available LCA tools/software solutions comparing the different methodologies, the providing organization, the target sector, the availability and costs.

1. LCA workshop(s) BizUp

Organizer: PP5-BizUp
Date: 28.04.2025 2025 & 19.05.2025
Location: University of Applied Sciences, Wels, Austria
Participants: 4 SME (Woom, Coiss GmbH, Polymerwerkstatt GmbH, Camo)

BizUp organized a two-part Quick-Start Workshop on Life Cycle Assessment (LCA), specifically designed for small and medium-sized enterprises (SMEs). The workshop was held in cooperation with the University of Applied Sciences Wels, which contributed its long-standing expertise in both LCA research and practical implementation in companies.

The workshop aimed to build a fundamental understanding of sustainability assessment, introduce the methodology of LCA, define key internal conditions for applying it in business settings, and identify potential areas for improvement and optimization.

The first session provided a compact introduction to the basics of LCA. It covered key concepts such as ecological sustainability, Corporate and Product Carbon Footprints (CCF and PCF), and the methodological foundations of LCA according

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to ISO 14040/44. A reference example was used to illustrate and discuss the theoretical content in a practical context. The session also addressed implementation aspects in companies, including relevant processes, data management, and tools.

In the second session, participants applied the method hands-on using a real product from one of the participating companies. They defined the goal and scope of the analysis, including system boundaries and assumptions. The life cycle inventory phase focused on process analysis and the flow of materials and energy. During the impact assessment, participants selected relevant impact categories and calculated environmental effects such as the CO_2 footprint. In the final interpretation phase, results were evaluated through hotspot analysis, scenario discussion, and the identification of possible optimization and eco-design strategies.

To ensure a meaningful and targeted application, information on the product to be analyzed was provided in advance. The exchange among companies and with the scientific partner significantly contributed to the practical relevance and applicability of the workshop content.

Images: CradleALP LCA-Workshop at University of Applied Sciences Wels organized by BizUp

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2. LCA workshop CCB

Organizer: PP3-CCB
Date: May 6th, 2025
Location: Hybrid event, on-site in the CCB offices in Nuremberg, Germany
Participants: 11 (7 on-site, 5 online, 3 registered but not participated)

Together with the LCA expert Cathrin Cailliau of the Bavarian consulting company Yordas CCB organized a five hour workshop on Life Cycle Assessment. After an introduction on LCA Mrs. Cailliau focused on the four phases of an LCA (target definition, life cycle inventory, impact assessment, interpretation), explained important standards & guidelines (ISO 14040/44), emphasized the requirement of data providing examples illuminating practical challenges in data acquisition and showed how LCA is linked to circular economy and ecodesign in manufacturing companies.

The participants, representing SMEs and research institutes from Bavaria and the CCB network, used the workshop for discussing individual challenges with the expert and other participants.

CCB introduced the Cradle-ALP project and informed about additional services including individual services and collective activities. Most important CCB also presented the Cradle-ALP guide on LCA, 'Don't Panic – A Beginner's Guide to Life Cycle Assessment'.

Images: Cradle-ALP LCA-Workshop in collaboration with Cathrin Cailliau, Yordas Group; May 6th in Nuremberg with 7 participants on site

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3. LCA workshop(s) Polymeris

Organizer: PP8
Date: June 24th, 2025
Location: Lyon, France
Participants: 19

On June 24, 2025, an event dedicated to Life Cycle Assessment (LCA) was held in Lyon as part of the European project Cradle ALP. The event brought together 19 participants from diverse backgrounds, including SMEs, large industrial groups, consulting firms, and technical centers, demonstrating the growing interest in eco-design and sustainability across the industry. The day began with an introduction to Matéri'act, followed by a tour of the facilities. One of the key moments was the presentation of the LCA Guide developed within the Cradle ALP project. Designed as a practical and accessible tool, the guide aims to support companies—particularly in the plastics and composites sectors—in implementing LCA approaches and integrating them into decision-making processes. Several industrial testimonials highlighted the strategic relevance of LCA:

- Forvia presented how LCA is used as a strategic tool to support environmental decision-making.
- Michelin shared insights on the challenges of data comparability in LCA, a key issue for many industrial players.

The afternoon featured:

- A presentation of the GREENSMARTMED European project, showcasing international support opportunities for companies.
- A focus on C3R'IMPACT, a dedicated LCA tool for the plastics and composites sectors.
- A collaborative workshop on comparative LCA, allowing participants to engage directly with the methods and tools presented.

Industrial participants expressed strong appreciation for the LCA Guide, highlighting its usefulness not only as an operational support tool but also as a training resource, particularly for onboarding new employees.
This day successfully showcased the outcomes of the Cradle ALP project, especially the dissemination of the guide, while strengthening awareness and building LCA-related skills among industrial stakeholders as part of their environmental transition strategies.

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4. LCA workshop(s) CCIS

Organizer: PP7 (together with Linking Map company)
Date: 27.09.2024
Location: Zasavska gospodarska zbornica, Podvine 36, 1410 Zagorje ob Savi
Participants: 14

CCIS organized a half-day workshop on applied sustainability analytics, focusing on the connection between Life Cycle Assessment (LCA) and the European Sustainability Reporting Standards (ESRS) at one of its regional chambers (in Zasavje region). CCIS organized this workshop together with a company, Linking Map that specializes in LCA. The event brought together representatives of SMEs and other regional stakeholders interested in integrating sustainability practices into business strategy and reporting.

After an introduction to the Cradle-ALP project, the session began with a presentation of the fundamentals of sustainability analytics, including ESRS requirements and reporting approaches. A concrete LCA case study was used to demonstrate how environmental impacts can be evaluated and interpreted.

In the second part of the workshop, participants were guided through the key steps of conducting an LCA, from defining the process and product boundaries to analyzing the results for both a product and its packaging. The session highlighted how LCA outcomes can inform ESRS-compliant sustainability reports and broader corporate sustainability strategies.

Throughout the workshop, the organizers emphasized the practical value of LCA as a tool for decision-making in circular economy initiatives and ecodesign, particularly for manufacturing SMEs. Participants engaged actively in discussions and used the opportunity to clarify how they could apply these methods in their own organizations.

The workshop concluded with an open Q&A session, where attendees posed questions about data availability, practical challenges, and the integration of analytics into formal sustainability reporting.

Images: Cradle-ALP workshop on LCA organized by CCIS

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5. LCA workshop(s) TZ Horb

Organizer: PP2
Date: Arpi 2nd, 2025
Location: PLIC, Horb, Germany
Participants: 9 (200 online)

Together with the LCA expert Jens Albrecht the TZ Horb organized a four-hour workshop on Life Cycle Assessment. The workshop targeted company representatives and leaders without any previous knowledge about the method and utility of LCA. Starting the workshop with an introduction and the question in which areas this tool could be applied to. The focus was on products, processes and organizations and linked those to real-market examples. Core aspects were the four phases of a professional LCA (target definition, life cycle inventory, impact assessment, interpretation). Relevant ISO-norms were further discussed, such as:

- ISO 14040:2006 (environmental management)
- ISO 14044:2006 (environmental management)
- ISO 14006 (environmental management systems)
- ISO 14001 (environmental management systems)
- PAS 2050 (product carbon footprint)

During the workshop the Cradle-ALP guide on LCA, 'Don't Panic – A Beginner's Guide to Life Cycle Assessment' was presented. Practical tasks exemplified how easy it is to apply LCA using exemplary products of some of the participating SMEs.

TZ Horb informed about the Cradle-ALP project and additional services including individual services and collective activities.

Image: LCA workshop with 9 participants organized at TZ Horb in April 2025

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4.4. Joint Company Visits

Match making events are an offer to companies to build new collaborations and to find future business partners and potential technology providers. However, providing SMEs the opportunity to meet with potential partners can only be a first step. To organize follow-up meetings for two companies with a common interest in collaboration is important. In the best case, Cradle-ALP partners can support SMEs directly by organizing on-site visits of the potential future partner company. This way, the collaboration is intensified and concrete actions can be moderated and followed.

1. **Company visits - Rottal Hanf (GER) and Grüne Erde (AT)**
   After an initial introduction of representatives of both companies in autumn 2024 an on-site visit of the production site of Grüne Erde in Upper-Austria was organized by Chemie-Cluster Bayern. This visit took place on January 21st, 2025 accompanied by PP3-CCB and PP5-BizUp.

   On March 12th, 2025 the two companies met during a return visit at the Rottal Hanf site in Bavaria discussing in detail the material requirements and exchanging testing materials, thereby strengthening the collaboration

   Grüne Erde is a manufacturer of furniture, interior products and cosmetics which decided many years ago to strongly focus on sustainable and natural products minimizing environmental impact. For many products only natural materials such as hemp fibres are used for their products.

   Rottal Hanf is a start-up company located in the South of Bavaria specializing in a new harvesting process to produce high quality, long hemp fibres for applications in construction and interior products. Both companies are strongly committed to build regional value chains which serves as a basis for the future collaboration.


Image: First meeting of Rottal Hanf and Grüne Erde on Jan 21st, 2025 in Scharnstein, Austria

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The mutual company visits helped to strengthen the partnership and to learn about eachother's expertise, products as well as needs and requirements. According to a message from the founders of Rottal Hanf, both companies agreed in March on starting a business relationship in which Rottal Hanf will deliver hemp fibers that will be processed by Grüne Erde.

2. Company visit – Meusburger, 04.07.2024

On July 4th, 2024, TZ Horb organized a company visit at Meusburger, an Austrian engineering company specialized in mold making. Numerous partners of TZ Horb, such as Arburg, BORGWARE, DIRECT tec, Faisst, Gindele, Hauff GmbH, ITK, Kunststoffkompetenzteam, MS Ultraschalltechnologie, Probotech, ProPlas, SWS packaging, and Zimmer GmbH gained insight in the facilities and processes of the internationally leading tools manufacturer. The participants had the opportunity to directly face enormous melting pots and to discover innovative intralogistics. The complexity and precision needed in the processing of the manufactured tools was surprising. Another highlight was the expert panel on modern knowledge management.

3. Company visit at cirp, 19.09.2024

TZ Horb and several company partners came together at cirp in Heimsheim, celebrating the 30th anniversary of the company. Numerous partners (Arburg, DIRECT tec, Engel, Gindele, Kling, MS Ultraschalltechnologie, Plasma technology, Priomold, ProPlas, Rudolf Michael GmbH, Schweitzer Chemie, SKZ, STM Stahlservice Center, Stolmar & Partner, Stratec SE, Tablo design, VISIOTECH, Zecha, Zimmer GmbH) of the network joined the event to gain insights into the additive manufacturing processes and capabilities of one of the pioneers in industrial 3D printing. After a warm welcome by the Managing Director, participants attended an inspiring keynote titled "Industrial 3D Printing in Theory – Between Hype and Reality." He shared valuable insights into the development of additive manufacturing, the fading hype after 2017, and the lasting relevance of the technology across industries. Whereby the need for experience and expertise in achieving quality standards were underlined, which encouraged companies to explore the potential of 3D printing, ideally with strong partners like cirp. During the subsequent company tour, attendees discovered a broad range of additive manufacturing methods such as laser sintering, stereolithography, PolyJet printing, vacuum casting, and metal casting. We were impressed by the precision of the 3D-printed components and the integration of injection molding in the production workflow. Another highlight was the summary session by Thomas Lück (Head of Sales & Innovation) and Alexander Brock (Project Consultant), reflecting on key topics from cirp's anniversary celebration, such as fire testing of plastics, medical applications, design strategies, and legal frameworks related to additive manufacturing. The event concluded with

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networking and a joint barbecue evening, rounding off a successful day filled with technological insights, expert knowledge, and inspiring conversations.

4. Company visit at Vogt Plastic, 30.09.24

TZ Horb organised a company visit at Vogt Plastic in Rheinfelden, where network partners (alkus GmbH, Arburg, cirp, Holimaker, Jomahan consulting, ProPlas) gained insights into cutting-edge plastic recycling. Since 2011, Vogt Plastic has been a pioneer in the circular economy, processing around 10% of Germany's plastic waste through advanced mechanical recycling without chemical methods. The event started with a presentation on Vogt's approach to turning household plastic waste into high-quality regranulates and ground-material. The company views itself not as a waste handler, but as a plastics manufacturer focused on emissions reduction and resource conservation. A key highlight was the plant tour, where participants experienced the full recycling process: from waste intake and sorting to the production of new materials. The visit showcased Vogt's technical expertise and commitment to sustainability. Challenges such as tooling requirements and strict regulations in Germany were discussed, alongside the need for broader acceptance of recyclates.

5. Company visit - Lauffer (DE), 23.01.25

TZ Horb organised a visit to the Maschinenfabrik Lauffer in Horb for several network partners including Aldinger Industries, Arburg, BORGWARE, cirp, DHBW, Dietrich Aldinger, Engel, Fischer, Gindele, GW Technik, Hauff GmbH, Hermann Ultraschalltechnik, Holimaker, HRS flow, Infinex, Jomahan consulting, Kunststoff- und Elektrotechnik GmbH, Kurz Kunststoffe GmbH, LEAD Digitalsierung, Priomold, ProPlas, RAMPF, SAR electronic, SIGMASOFT, SKZ, STM Stahlservicecenter, Stolmar & Partner, Stratec SE, Tevipack, VAW, Visiotech, Werner Koch Maschinentechnik, and Zimmer GmbH. The event offered a fascinating tour of Lauffer's production facilities, revealing the company's impressive innovation and market reach. Key insights came from Martin Mühlen (ARBURG) and Dejan Micic (Technologiezentrum Horb), highlighting both achievements and future visions for the network.

Participation in Match Making during Start-up BW Summit 25

Sector focus/topic: Aerospace, Quantum & Future Materials; Creative Industrie, Fashion & FoodSocial Innovation & GovTech; Data, Cybersecurity & FinTech; Energy & GreenTech; Life Science, MedTech & BioTech; Manufacturing, Mobility & Hardware
Date: June 2nd, 2025
Location: onsite, Stuttgart
Number of bilateral meetings: 12 meetings between TZ Horb and start-ups

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5. Report on Individual Activities

5.1. LP 1 – CCIAA Padova

Introduction to Individual Activities - Wood & Furniture Sector

All companies listed below were initially contacted via email and followed up by phone. A dedicated 1-hour online consultation was then scheduled with each of them. During these bilateral sessions, the Cradle-ALP project and the objectives of the C2C roadmap were presented, and the QuickScan tool was applied to assess their potential and interest in circular transformation. Depending on their internal priorities and planning horizon, companies either decided to enrol in the online support services offered by the project or opted to reconnect at a later stage for more specialized consulting.

1. 3B

- **Date**: 04/05/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: 3B is a leader in industrial furniture components, particularly in the use of recycled and sustainable materials. During the session, the QuickScan helped explore the company's readiness to further integrate circularity in product design and material sourcing. The analysis revealed opportunities in closed-loop strategies and collaboration with research centers (e.g., Matech) for testing new treatments on reclaimed wood
- **Challenges**: ensuring industrial compatibility and certifications for bio-based and recycled materials
- **Next steps**: participation in matchmaking events; evaluation of reverse logistics feasibility.

2. 3D Wall Panels

- **Date**: 10/04/2025
- **Tool used**: QuickScan
- **Status**: participated
- **Notes**: interest in integrating regenerated wood into decorative products.

3. Anodica

- **Date**: 09/04/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: Anodica supplies high-end aluminum finishes for the furniture and automotive sectors. While not a wood processor, the company plays a key role in sustainable supply chains. The QuickScan enabled reflection on post-sale services

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and life extension strategies for its components. The company expressed interest in redesigning services to reduce environmental impact
- **Challenges**: aligning circularity with clients' traditional expectations
- **Next steps**: internal follow-up to develop a value proposition for green-conscious clients.

4. **Arbor**

- **Date**: 16/04/2025
- **Tool used**: QuickScan
- **Status**: future follow-up planned
- **Notes**: will evaluate participation based on future design developments.

5. **Art Design**

- **Date**: 17/04/2025
- **Tool used**: QuickScan
- **Status**: future follow-up planned
- **Notes**: awaiting alignment with strategic timelines for R&D.

6. **Bottega Artigiana d'Arte Lignea**

- **Date**: 07/05/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: a small artisanal workshop specializing in wooden sculptures and restoration, Bottega Artigiana expressed a strong cultural and environmental awareness. The QuickScan process was used to map potential reuse of production scraps and the storytelling value of reclaimed wood
- **Challenges**: low scalability due to highly manual production
- **Next steps**: evaluation of partnerships with circular material platforms (e.g., Alta Materia).

7. **Buzzoni Srl**

- **Date**: 22/04/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: Buzzoni is a well-established manufacturer of wooden windows and doors. Through the QuickScan, the company mapped its waste production and considered reusing offcuts or sawdust for secondary products. Environmental communication emerged as a key lever for differentiation in both domestic and export markets
- **Challenges**: lack of internal digital tools to track and quantify waste
- **Next steps**: identification of partners for circular packaging and valorization of wood waste.

8. **Cube3**

- **Date**: 14/07/2025

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- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: Cube3 is a contract furniture supplier working mainly on public and private interiors. The QuickScan exercise highlighted the need to increase transparency in procurement and to prioritize local, certified, and low-impact suppliers. A strong interest was expressed in collaborative platforms that match clients with sustainable suppliers
- **Challenges**: traceability and verification of circular claims in complex projects
- **Next steps**: exploring supplier mapping tools and involvement in circular design pilot projects.

9. Ettomio

- **Date**: 07/04/2025
- **Tool used**: QuickScan
- **Status**: future follow-up planned
- **Notes**: reconnect planned to explore circular modular furniture models.

10. Falegnameria PM

- **Date**: 11/04/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: a small woodworking company focusing on custom furniture and fittings. The QuickScan session prompted the company to reflect on longevity and modularity of its products and how to offer repair or refurbishing services. Their craftsmanship offers potential for value retention strategies such as product restoration
- **Challenges**: resource constraints in organizing take-back systems
- **Next steps**: pilot testing of post-sale services in partnership with circularity consultants.

11. Lesko Srl

- **Date**: 11/04/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: Lesko works with reclaimed wood to produce decorative and structural items. The QuickScan revealed opportunities to scale up the business model by offering modular solutions for temporary installations (e.g. events). The company is also evaluating a take-back scheme for its displays
- **Challenges**: building a reliable logistics and maintenance network

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- **Next steps**: co-design workshop with clients and designers to test modularity solutions.

12. Marlegno

- **Date**: 19/05/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: Marlegno builds sustainable timber structures and buildings. Through QuickScan, the firm explored options for managing construction offcuts, reintroducing them into the production cycle or offering them to creative reuse networks. Interest was expressed in developing a digital material inventory system
- **Challenges**: regulatory limits on waste reuse and classification
- **Next steps**: in-depth analysis of waste streams and compliance pathways.

13. Micra Srl

- **Date**: 06/05/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: Micra produces wooden components and semi-finished goods. During the consultation, QuickScan helped assess gaps in sustainability reporting and map potential recovery of packaging and offcuts. The company is also exploring more sustainable packaging solutions
- **Challenges**: limited integration of sustainability in product design
- **Next steps**: review of supply chain sustainability and engagement in future collective training sessions.

14. Milan Arredamenti

- **Date**: 15/05/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: Milan Arredamenti crafts bespoke furniture for residential and nautical applications. QuickScan supported the evaluation of modular design, end-of-life return policies and possibilities for refurbishment. A pilot take-back scheme for selected customers is under consideration
- **Challenges**: low client awareness of circular opportunities
- **Next steps**: development of customer education materials and green branding.

15. Natur Design

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- **Date**: 08/04/2025
- **Tool used**: QuickScan
- **Status**: future follow-up planned
- **Notes**: open to future exploration of sustainable supply chain partners.

16. Pavanello Serramenti

- **Date**: 12/05/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: a long-standing manufacturer of high-quality wooden windows and doors. QuickScan helped identify opportunities to reduce packaging impacts and engage in environmental communication abroad. The company is also exploring lifecycle marketing strategies
- **Challenges**: fragmentation of sustainability initiatives across departments
- **Next steps**: mapping internal practices and developing a shared sustainability roadmap.

17. Quadrifoglio Group

- **Date**: 12/05/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: a long-standing manufacturer of high-quality wooden windows and doors. QuickScan helped identify opportunities to reduce packaging impacts and engage in environmental communication abroad. The company is also exploring lifecycle marketing strategies
- **Challenges**: fragmentation of sustainability initiatives across departments
- **Next steps**: mapping internal practices and developing a shared sustainability roadmap.

18. Segheria Traiber

- **Date**: 05/05/2025
- **Tool used**: QuickScan
- **Status**: enrolled
- **Summary**: traditional sawmill active in timber production. QuickScan helped identify offcut streams suitable for reuse in furniture and decor sectors. The company is open to being a material supplier in circular pilot chains
- **Challenges**: lack of traceability tools for by-products
- **Next steps**: technical support for material classification and matchmaking with potential partners (e.g. 3D Wall Partners).

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19. Matech (Research Center)

- **Time:** technical session + matchmaking event
- **Tools used:** materials database
- **Starting point:** research and testing on natural materials
- **Results:** prototyping surface treatments for reclaimed river wood
- **Challenges:** limited access to LCA databases for small research centers
- **Lessons learnt:** collaborations with companies accelerate material validation
- **Other observations:** key technical partner for 3B, Alta Materia and SustainMe.

20. SustainMe

- **Time:** cross-cutting support during events
- **Tools used:** LCA Guide, design thinking facilitation
- **Starting point:** sustainability consultancy
- **Results**: supported several SMEs in defining circular strategies
- **Challenges:** need for advanced training in industrial sustainability advisory
- **Lessons learnt:** facilitators play a critical role in translating tools into action
- **Other observations**: strong cooperation with Matech, Alta Materia and CCIAA Padova.

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#	Company	Country	Sector	Tool/Activity
1	3B Spa	Italy	Wood & Furniture	QuickScann
2	CM PRODUCT GROUP SRL - 3d wall papers	Italy	Wood & Furniture	QuickScann
3	Anodica SrL	Italy	Wood & Furniture	QuickScann
4	Arbor SrL	Italy	Wood & Furniture	QuickScann
5	Artdesign Srl	Italy	Wood & Furniture	QuickScann
6	Buzzoni SrL	Italy	Wood & Furniture	QuickScann
7	CASALANDO S.R.L. - Bottega Artigiana Veneta	Italy	Wood & Furniture	QuickScann
8	Cube 3 srl	Italy	Wood & Furniture	QuickScann
9	Ettomio srl	Italy	Wood & Furniture	QuickScann
10	Falegnameria PM	Italy	Wood & Furniture	QuickScann
11	Lesko SrL	Italy	Wood & Furniture	QuickScann
12	Marlegno SrL	Italy	Wood & Furniture	QuickScann
13	Matech - Parco Scientifico Galileo	Italy	Wood & Furniture	QuickScann
14	Micra SrL	Italy	Wood & Furniture	QuickScann
15	Milan Arredamenti	Italy	Wood & Furniture	QuickScann
16	Naldo SrL	Italy	Wood & Furniture	QuickScann
17	Nardi srl	Italy	Wood & Furniture	QuickScann
18	NEE Srl - SuatainMe	Italy	Wood & Furniture	QuickScann
19	Pavanello serramenti	Italy	Wood & Furniture	QuickScann
20	Quadrifoglio srl	Italy	Wood & Furniture	QuickScann
21	Segheria Traiber	Italy	Wood & Furniture	QuickScann
22	Segheria 3B	Italy	Wood & Furniture	QuickScann

Table: Summary of companies individually supported by CCIAAPD

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Conclusion and lessons learnt

The implementation of the Cradle to Cradle (C2C) approach in the wood and furniture sector presents both significant opportunities and notable challenges. Throughout the pilot activities and coordination meetings, the TSWG Wood/Furniture identified a growing awareness among manufacturers regarding sustainability, but also encountered structural and systemic barriers that slow down the adoption of circular design principles.

Key gaps include the absence of a comprehensive green reverse logistics system and the incompleteness of current recycling infrastructures. The bulky nature of furniture waste and the lack of efficient systems for its collection, reuse, and remanufacturing pose major obstacles to the circular lifecycle envisioned by C2C models.

Barriers were also observed in the form of:

- the high carbon footprint of commonly used building and furnishing materials;
- the difficulty in recycling composite materials, such as wood-plastic blends;
- and a shortage of skilled labor, which limits the sector's capacity to experiment with and implement new circular processes.

Despite these limitations, several positive drivers emerged:

- An increasing number of manufacturers are adopting sustainable practices, including the use of recycled or responsibly sourced wood, reduction of production waste, and investments in eco-design.
- The availability of C2C-certified materials, such as Accoya® wood, confirms the technical and commercial viability of incorporating certified sustainable inputs into the value chain.
- Moreover, government initiatives and legislative support—like recycling programs and national circular economy frameworks—are fostering an environment that supports innovation aligned with C2C principles.

From a project implementation perspective, the most effective strategy was the direct, one-to-one engagement with SMEs, which proved more successful than broad promotional campaigns. Participation in events such as CIRPLEX 2025 and sector-specific matchmaking activities highlighted the value of cross-sectoral collaboration, especially with industries like textiles and polymers that share challenges and opportunities in material substitution and recycling.

In conclusion, the pilot confirmed that while the wood-furniture sector is structurally ready to transition, targeted support, sector-specific tool adaptation, and policy-level interventions are essential to overcome current limitations and scale the implementation of C2C principles across regions.

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5.2. PP 2 – TZ Horb

Daniacompack – Fischer Workshop
Daniacompack sought access to companies with testing facilities in material research. TZ Horb organized a half-day workshop with Fischer to explore potential collaborations. QuickScan and Direct Matching tools were used to identify relevant partners. As a result, Daniacompack connected with two research institutes offering material testing services. The challenge was limited knowledge about potential network partners initially, which was mitigated by a more structured approach in follow-ups. The activity underlined the importance of early needs assessment for targeted matches.

Arburg – Carbonauten Workshop
Arburg and Carbonauten jointly participated in a half-day workshop. Carbonauten had processing difficulties with their granulate in injection molding machines. Using Circularity Compass and SBMC, TZ Horb helped Arburg provide technical support, while Carbonauten explored business model adjustments. Although some technical issues needed further testing, the workshop facilitated a valuable exchange and identified future testing needs. The technical complexity required combining strategic tools with hands-on trials.

Remondis – INNONET Company Update
At a 1-hour INNONET update session, TZ Horb presented a QuickScan overview and introduced circular economy concepts to Remondis and other participants. The update raised sustainability awareness and stimulated interest in follow-up workshops. However, the format limited deep engagement per company. The event showed that awareness sessions must be followed by tailored support to trigger concrete actions.

Herrmann Ultraschall – cavigen Company Visit
During a 2-hour on-site visit, TZ Horb facilitated an exchange between Herrmann Ultraschall and cavigen to discuss ultrasonic welding capabilities. Direct Matching was used to align technical requirements with partner competences. While initial feasibility was promising, technical validation through prototype testing was necessary. Early visits proved useful for mutual understanding despite remaining uncertainties.

Stratec – cavigen Company Visit
TZ Horb coordinated a 2-hour visit between Stratec and cavigen focused on innovation opportunities. The SBMC tool supported strategic discussions about sensor integration and product features. Time constraints limited in-depth exploration but helped identify common interests for future collaboration.

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Herrmann Ultraschall – art-glove Workshop

In a creative half-day workshop, TZ Horb brought together Herrmann Ultraschall and art-glove, a wearable tech start-up. The session used SBMC, Circularity Compass, and prototyping sketches to develop sustainable, modular product concepts compatible with ultrasonic welding. Communication challenges arose due to different industry vocabularies, highlighting the need for clear moderation in interdisciplinary formats. The workshop sparked plans for joint prototyping projects.

#	Company	Country	Sector	Activity Type
1	Daniacompack	GER	Packaging/Material Research	Workshop / Direct Matching
2	Fischer	GER	Material Testing	Workshop / Direct Matching
3	Arburg	GER	Injection Molding	Workshop
4	Carbonauten	GER	Material Processing	Workshop
5	Remondis	GER	Waste Management	Company Update
6	Herrmann Ultraschall	GER	Ultrasonic Welding	Company Visit / Workshop
7	cavigen	GER	Medical Devices	Company Visit
8	Stratec	GER	Medical Devices	Company Visit
9	art-glove	GER	Wearable	Workshop

Table: Summary of companies individually supported by TZ Horb

Conclusion and lessons learnt

We discovered that most of the tools are very useful, especially for (early-stage) startups and entrepreneurs, but difficult to apply on established and mature corporates.

It was challenging to convince companies to invest their time on piloting these tools. Startups were much more open to them, but preferred to test them in larger groups with other founders (combined with some networking).

The amount of benefit companies gained from these tools seemed to decrease with their maturity. The most impact we achieved with the young talents from different companies in the joint Fischer Technik Serious Play workshops. For this reason, we plan to further roll-out these concepts and to offer them to several more companies in our region and beyond.

We detected an overall interest in the topic of sustainable strategies and adjustments, but especially established companies often treat this topic like a “nice-to-have” and don´t want to invest time (or money) for this during economically challenging periods. It is important to point out the saving potentials which can easily be combined with more sustainable strategies and productions. This result led us to the establishment of an energy efficiency network to access the topic of sustainability from this direction.

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5.3. PP 3 – CCB

Regarding individual activities CCB focused mainly on direct company matching, company visits and Quick Scan Circular Business Models. Unfortunately, no SME was interested in using the Circularity Compass.

Direct matching

- *CSC Jäcklechemie GmbH, Nürnberg, DE & Composite Recycling, Ecublens, CH*

  CSC Jäcklechemie is a chemical trading company selling specialty and industrial chemicals, coatings etc. In their effort to source alternative resources for their chemicals the company is also interested in pyrolysis oil, a product that could replace fossil crude oil in the chemical industry to manufacture base chemicals. Composite Recycling is a start-up company from Switzerland developing a pyrolysis-based chemical recycling process of fibre-reinforced composite materials. Next to recovering glass and carbon fibres there is also pyrolysis oil produced. Both companies were introduced to each other via an online meeting. The outcome of the first meeting was an agreement to exchange material for testing. The following meeting showed that the pyrolysis oil does not fulfil the requirements needed by CSC Jäcklechemie. Further cooperation was therefore not sought.

- *Rottal Hanf GmbH, Ering, DE & Grüne Erde GmbH, Scharnstein, AT*

  Grüne Erde, an Austrian high-end furniture manufacturer, has long been searching for animal-free alternatives to replace wool in their mattresses and textiles. The start-up Rottal Hanf collaborates with regional farmers cultivating hemp to make a natural and renewable fibre available for use in the furniture and textile industries. Knowing about Rottal Hanf's expertise in hemp fiber processing CCB recognized the potential synergy and initiated an introductory meeting. This first meeting in November 2024 was successful and both companies agreed on several mutual site visits (first quarter of 2025) to get a better understanding of products and material needs, to explore the possibilities of integrating hemp fibers into Grüne Erde's product lines and to exchange material samples for testing. Currently, the two companies are preparing the next steps for a collaboration and have started contractual preparations for future supply cooperation.

QuickScan

- *Biofibre GmbH, Landshut, DE*

  Date: 09.01.2025
  Tool used: QuickScan
  Summary: Biofibre is a Bavarian SME offering compound materials made from biobased and/or recycled plastics for various applications ranging from outdoor

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equipment to packaging and toys. Biofibre benefitted from the QuickScan coaching through rethinking their own business and revenue model.
Challenges: ensuring compatibility with diverse certifications for the different customers
Next steps: participation in Cradle-ALP match making events and joint booth at CIRPLEX summit

- *TwoGee Biotech, Martinsried, DE*

  Date: 19.03.2025
  Tool used: QuickScan
  Summary: TwoGee is a young start-up with large expertise in engineering and production of enzymes to hydrolyse cellulosic materials. The released sugars can be used for fermentation processes to produce biobased chemicals and polymers. The founders profited from the QuickScan tool because they could use the different suggestions on revenue models, started thinking about necessary supporting processes and organizational forms and felt enabled to use the provided terminology for the acquisition of public funding.
  Challenges: secure funding to establish the company and enzyme production
  Next steps: applying for public funding and build business relationships to potential customers in the bioeconomy

- *Mimbiosis, Freising, DE*

  Date: 19.03.2025
  Tool used: QuickScan
  Summary: Mimbiosis is an early Munich based start-up developing a process to produce mycelium-based materials from textile wastes. As it is not clear yet how the start-up can establish a profitable business with the idea, Mimbiosis benefited most from the various ideas of business models.
  Challenges: scale-up of production process and regulatory limits on waste
  Next steps: secure funding and finding partners/customers in value chain

- *Nuterials, Munich/Copenhagen*

  Date: 19.03.2025
  Tool used: QuickScan
  Summary: Nuterials is a start-up of two Bavarian founders who recently moved to Denmark. The two founders used the QuickScan results to discuss their need of supporting processes and additional competences for developing the company.
  Challenges: develop internal processes
  Next steps: enlarge own business network and identify customers

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Further additional activities

Several other Bavarian SMEs and start-ups were supported by providing opportunities to present their products, expertise and services.

Triangular and Neue Materialien Bayreuth gave a presentation of their services in the first online match making on composites and polymers. In addition, they actively used the match making platform to make new contacts with companies in France, Austria and Slovenia.

HeiQRas, a material company from Regensburg, the start-up Container Grid, providing a software for circular value chains, and TZZ Waldkraiburg, a newly established research center for composite materials, participated in the match making as well.

At the Cradle-ALP consortium meeting in Munich at the beginning of December 2024 Container Grid, Weimako and IBP of University of Applied Sciences Hof presented their technologies. Weimako is a small manufacturer of rigid packaging for the cosmetics industry using biodegradable compounds. The Institute of Applied Biopolymer Research and Circularity (IBP) presented novel developments of biodegradable compounds for packaging.

Biofibre and the company Pacoon followed the invitation to exhibit at the joint CradleAlp booth during Cirplex Summit in Klagenfurt and to represent jointly with CCB the Bavarian Cradle-ALP region. Both made a high number of novel industry contacts using match making extensively.

The packaging manufacturer Gruber Folien gave an expert presentation at the online match making event on packaging explaining their company strategy to make their products circular.

Conclusion and lessons learnt

As chemicals and materials are the basis of all manufactured goods CCB was involved in the different value chains to some extent.

Directly matching companies worked best as CCB works closely with the member companies to understand their technological needs, challenges and expertise. But the process is laborious and success is not guaranteed as seen with the connection of CSC Jäklechemie and Composite Recycling. This makes the successful matching of Grüne Erde and Rottal Hanf even more significant.

As for most of the other partners it was not easy to identify and convince SMEs to participate in the individual services. Communication and advertisement were not clear enough to show the benefit to the SMEs. However, the SMEs and start-ups that participated were thankful for the support, the possibility to get ideas and to discuss their business in the context of circularity.

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Due to the fact that it was challenging to find companies interested in the individual services, from CCB's perspective it was a good decision to focus more on collective actions. The organization of online and onsite match making events gave a lot of opportunities for the companies of the region and the cluster network to learn about new technology developments and to get in direct contact with solution providers from other Alpine regions. The decision to use the online tool (B2match) as a platform proved to be very useful because, first, some CCB members used the platform to organize meetings prior and after the actual online event. And second, with every new match making event novel participants registered to the platform, so that a community of companies interested in circular economy has started to grow. This platform was able to provide cross-regional exchange between companies. This concept worked very successfully at the online match making for chemistry and polymers as well as at the CIRPLEX summit.

In addition, the collective activities such as Lego Serious Play workshop and the LCA workshop showed to be very useful for the participating SMEs because they not only used them to achieve new knowledge but also to discuss, for example, regulatory questions in a peer-learning manner. Unfortunately, those workshops were only on a regional level.

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#	Company	Country	Sector	Tool/Activity
1	Biofibre GmbH	GER	Chem/Mat, Packaging	QuickScan, Match Making, joint booth
2	Rottal Hanf GmbH	GER	Chem/Mat	Direct Matching
3	Grüne Erde GmbH	AT	Wood/Furniture	Direct Matching
4	CSC Jäcklechemie GmbH	GER	Chem/Mat	Direct Matching
5	Composite Recycling	CH	Chem/Mat	Direct Matching
6	TwoGee GmbH	GER	Chem/Mat	QuickScan
7	Mimbiosis	GER	Chem/Mat	QuickScan
8	Nuterials	GER/DK	Chem/Mat	QuickScan
9	HeiqRAS GmbH	GER	Chem/Mat	Match Making
10	Triangular GmbH	GER	Chem/Mat	Match Making, presentation
11	Neue Materialien Bayreuth GmbH	GER	Chem/Mat	Match Making, presentation
12	Container Grid	GER	Chem/Mat	Match Making, presentation
13	TZZ Waldkraiburg	GER	Chem/Mat	Match Making
14	Pacoon GmbH	GER	Packaging	Match Making, joint booth
15	IBP, University of Applied Sciences Hof	GER	Chem/Mat	Match Making, presentation
16	Weimako GmbH	GER	Chem/Mat, Packaging	Match Making, presentation
17	Gruber Folien GmbH	GER	Packaging	Match Making, presentation
18	Süd West Chemie GmbH	GER	Chem/Mat	LCA workshop
19	GfE Metalle und Materialien GmbH	GER	Chem/Mat	LCA workshop
20	Sonax GmbH	GER	Chem/Mat	LCA workshop
21	AbuQT	GER	Chem/Mat	LCA workshop

Table: Summary of supported SMEs, start-ups, research organizations by CCB. The list does not include SMEs of the CCB network that participated but are not based in Bavaria. There were more members of the CCB network at the LCA workshop or match makings that are not counted here.

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5.4. PP 4 – BOKU

The task of BOKU University in this context was mainly to provide expert inputs respectively contacts to relevant scientists from BOKU within the different transregional matchmaking events (online and onsite).

At the beginning Biz-up (PP5) and BOKU developed and conducted an online Webinar for Austrian SMEs on 25.09.24, where the Cradle-to-cradle Transformation toolbox was presented to provide a broad insight into our work.

Beforehand, this event was promoted intensively by BOKU on several digital channels (e-mails and social media). At least 37 persons (thereof 29 external) joined this meeting. BOKU also organised an expert for the keynote at the beginning of this webinar: Andreas Ellenberger, advisor of the Circular Economy Forum Austria and consultant and trainer for the implementation of circular economy solutions. He spoke about the necessity, benefits and feasibility of Cradle-to-cradle approaches and their legal background in the Austrian and EU regulations for SMEs presenting also some best practices of Austrian companies. Afterwards BOKU gave a short insight into two tools of the Cradle-ALP Toolbox (Maturity Assessment tool, Quickscan Circular Business Model Tool). After the presentation of all tools by Biz-up and BOKU the participating SMEs had the possibility to choose one of the tools and get in contact with Biz-up for further 1:1 training.

In close cooperation with Chemie Cluster Bayern (PP3), Polymeris (PP8) and Biz-up (PP5) the first matchmaking event “Composites Recycling and Circularity in the Alpine Space” on 20.03.25 was developed. Beforehand different invitations (per e-mail and social media) were conducted by BOKU to reach a broad spectrum of different SMEs and Start-ups. BOKU provided two important keynotes from the Institute of Waste Management and Circularity - “Brief overview of the regulation framework on Composites recycling” by Florian Part and “Applicability of the "Safe and Sustainable by Design (SSbD)-principle for SMEs: benefits and challenges” by Christoph Olscher. The first presentation offered an insight into actual and planned EU regulations in the context of the recycling of plastic and composite materials and thus the lack of specific recycling targets in the field of polymer-based composites or hybrid materials. Therefore, the importance of the SSbD principles already in the design phase and a guidance how to tackle these challenges were brought closer to the participating SMEs. By means of some BOKU research projects the applicability and advantages of the SSbD principle for SMEs was explained. Finally, further research, funding and collaboration are necessary to make SSbD more accessible and effective for SMEs.

Through this first matchmaking event 56 people (thereof 35 external) – mainly from Start-ups, SMEs and research organisations – could be reached and during the discussion afterwards BOKU experts provide accurate answers to some questions from the audience. After the official part the online B2B meetings were conducted, which were used quite intensively between the different SMEs and other participants: in total 23 bilateral meetings (thereof 15 transnational). Also, BOKU had one matchmaking meeting

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with the CEO from Triangular – a platform for matching available materials, processing systems and knowledge. Future collaborations within upcoming projects could be interesting and will be taken into consideration.

Furthermore, BOKU supported also Biz-up in finding adequate SMEs in Austria and could arrange one contact (Vienna Textile Lab - https://www.viennatextilelab.at/) for a 1:1 testing and for participation in the next matchmaking event CIRPLEX (1. Circular Plastics Experience Summit – Alpen-Adria) in Klagenfurt (14./15.05.25). There onsite, BOKU got in contact with several other SMEs and had also 1:1 matchmaking dates (SustainMe Hub, Green B2B Trading GmbH, HeroPAK, Sunpor Kunststoff GmbH, WoodKplus), where the potential for future collaboration was defined and contacts with BOKU scientists established. But also between different SMEs participating in CIRPLEX BOKU could arrange some contacts and promote the project Cradle-ALP by distributing some brochures (mainly the roadmaps) also within other companies who had a booth there.

For the further matchmaking events BOKU contacted and invited SMEs from all relevant Cradle-ALP sectors (wood & furniture, packaging) to have participants from different countries and fields of action.

On 26.05.25 the online matchmaking event “Wood-Furniture Innovation & Circularity” was organised by the Italian t2i (Technology Transfer and Innovation) together with the Lead Partner and on 13.06.25 the online matchmaking event “Packaging” organised by the Slovenian Chamber of Commerce and Industry (CCIS, PP7) was conducted. BOKU participated in both of these events, but although BOKU put a lot of energy into promoting these events unfortunately, just one from the invited SME from Austria (WoodKplus) could be motivated to participate in the wood-matchmaking event.

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5.5. PP 5 – Biz-Up

Webinar: Tools for the circular transformation, 25.09.2024

40 participants

On September 25, 2024, a webinar titled *"Tools for the Circular Transformation"* was held together with the BOKU University via Microsoft Teams, attracting around 40 participants. During the session, the full range of tools from the Cradle-ALP Toolbox was presented, offering an overview of their practical use in driving circularity. The event also featured a guest input from a professional speaker (organized by the BOKU University), adding valuable external perspective for SMEs. Participants were invited to reach out for further information or support in applying the tools within their own contexts.

Within the frameworks of the following events, the project, roadmaps and toolbox were presented to the participants. A focus was placed on the tools PP5 offered in greater detail, namely LCA, LSP, BMC and Circularity Compass. Participants were made aware of the offering provided through the Cradle-ALP project and informed that further information or even a consultation using one of the tools presented was possible free of charge. Further information on the individual activities carried out during these events on top of the overall presentation can be found in Chapter 5.5.

- **EDM Event Textile**
  01.10.2024, 32 participants
- **Round Table ERFA Plastics Recycling**
  06.12.2024, 32 participants
- **Activate Journey Tech2B**
  02.02.2025, 2 participants
- **Circular Bite Event**
  11.02.2025, 34 participants
- **Train the trainer Session with Tech2b**
  02.04.2025, 3 participants
- **Study Visit Cirevalc**
  04.04.2025, 15 participants
- **TRM Workshop: Collection, Sorting and Recycling**
  11.04.2025, 23 participants

Fachtagung Materials – Faserverbundwerkstoffe im Fokus (Presentation of Matchmaking), 13.03.2025

A slide was provided to advertise the Composite Matchmaking to an Austrian expert audience to raise awareness for the event.

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Circularity Compass

Vresh/dasMerch, 01.10.2024

On October 1, 2024, the Circularity Compass tool was presented during the EDM Textile Event hosted by PP5 with a focus on the textile, using the company Vresh/dasMerch as a practical example. The session included a brief overview of the tool and lasted approximately 20–30 minutes.

Vresh/dasMerch was selected due to their already advanced approach to sustainability and circularity. Their high level of awareness made them a suitable example to illustrate the tool's application, especially for the benefit of other participants who were less familiar with the concepts.

The activity successfully introduced the Circularity Compass not only to Vresh/dasMerch but also to over 30 additional attendees. The session served both as an individual case and a broader awareness-raising opportunity within the group.

However, time constraints limited the depth of engagement. A key takeaway is that a more extended session would have allowed for deeper discussion and interaction. It was also observed that using a plenary format helps maintain momentum and manage time efficiently, though it can allow some individuals to disengage more easily than in smaller group settings.

HEROPak, Imara, Layonardo, LawAI, Romy Robotics, 02.02.2025

On February 2, 2025, a 30-minute presentation was held as part of Tech2b's Activate Journey—a one-day event designed to provide newly founded startups with insights into various aspects of entrepreneurship. We were invited to contribute to the sustainability segment of the program, presenting a range of tools including the Business Model Canvas, Life Cycle Assessment (LCA), Lego Serious Play, and a detailed introduction to the Circularity Compass.

The participating startups—HEROPak, Imara, Layonardo, LawAI, and Romy Robotics—had little to no prior exposure to circularity tools. The session aimed to provide a first point of contact and inspire reflections on how sustainability could be meaningfully integrated into their business models.

Although the presentation successfully introduced key principles and sparked interest, time constraints again posed a challenge. The short time frame limited the opportunity for in-depth interaction and follow-up on individual questions.

A key lesson learned was that for very early-stage startups, a group format with a broad set of tools can be overwhelming. A more tailored one-on-one format might be more effective, allowing for deeper engagement and company-specific discussions. Additionally, having the right target group is important, as many start-ups are more based in IT and non-producing industries, making the circularity tools less tangible,

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especially at such early stages. However, this first touchpoint also allowed for further collaboration with HEROPak, for example during the LSP Workshop or for the shared booth at Cirplex.

Tech2B, 02.04.2025

On April 2, 2025, a 90-minute workshop was held with Tech2B, a startup consultancy based in Upper Austria. The session served two purposes: it was both a follow-up to earlier joint activities involving startups supported by Tech2B, and a dedicated "Train the Trainer" session to equip the consultancy team with in-depth knowledge of the Cradle-ALP Toolbox.

The workshop focused on three core tools—Business Model Canvas, Life Cycle Assessment (LCA), and a detailed walkthrough of the Circularity Compass. Especially, the latter was completely new to the team and was therefore discussed in greater detail. By training the Tech2B team directly, the goal was to ensure that these tools can continue to be applied beyond the lifetime of the Cradle-ALP project, reaching startups that are not directly involved in the project framework.

This approach strengthens the long-term impact of the project by embedding its methodologies into the consultancy's standard offering. The workshop successfully transferred knowledge and expanded the multiplier effect of the Cradle-ALP Toolbox.

One of the main challenges was logistical—finding a suitable date and time that accommodated a larger group of participants. However, once scheduled, the session was well-attended and positively received.

The session reaffirmed the value of training intermediaries such as startup hubs and consultancies: they serve as important bridges to target groups and ensure the continued use and relevance of project tools after its official end. It also enabled us to exchange with others what their experiences are with certain tools (for example the BMC, which is not a new tool to Tech2B), broadening our horizon beyond the exchange within the project consortium as well.

Fino, FeuerZEUG, Makarony Polskie, OPG Vina Bazon, 04.04.2025

On April 4, 2025, a two-hour workshop was conducted as part of the Cirevalc Study Visit through Upper Austria, bringing together four companies: Fino, FeuerZEUG, Makarony Polskie, and OPG Vina Bazon. The session introduced key tools from the Cradle-ALP Toolbox, including the Business Model Canvas, Life Cycle Assessment (LCA), and a detailed walkthrough of the Circularity Compass.

While FeuerZEUG already demonstrated a strong focus on sustainability, for many of the participating companies, the workshop offered a first in-depth opportunity to reflect on their production processes through a circularity lens. The interactive format enabled

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valuable peer learning, with participants gaining new awareness of how even small steps in production can have a larger impact.

Originally intended to focus on packaging, the workshop was adapted on short notice due to the limited knowledge among participants regarding the origin and lifecycle of their packaging materials. Instead, the session shifted to focus directly on the food products themselves, which proved to be more relevant and engaging.

A key takeaway was the high level of engagement once participants grasped the core concepts. The session offered quick yet meaningful insights into diverse food production practices and sparked a notable interest in exploring sustainability in more detail.

Business Model Canvas

FeuerZEUG, 11.02.2025

On February 11, 2025, a 30-minute workshop was held with FeuerZEUG as part of the Cirevalc Study Visit through Upper Austria. The session provided an in-depth application of the Business Model Canvas, alongside introductions to the Life Cycle Assessment (LCA) and the Circularity Compass.

FeuerZEUG, known for its strong commitment to sustainability, served as a leading example during the visit. While many of the participating companies were new to circular thinking, FeuerZEUG's advanced positioning made it possible to demonstrate the tools in a concrete and relatable way. The workshop not only benefited FeuerZEUG but also offered other participants a practical glimpse into how circularity tools can be applied to real-world business models.

Despite the limited timeframe, the session succeeded in laying a strong foundation for further reflection and optimization of FeuerZEUG's business model. However, the 30-minute slot proved too short to explore the tools in depth.

The experience highlighted the importance of allocating sufficient time for meaningful engagement, especially when working with companies already active in the sustainability space and ready to dive deeper.

1:1 consultation regarding available tools and impact

FeldOASE, 11.02.2025

On February 11, 2025, a 60-minute consultation was held with the start-up FeldOASE. The company operates an aquaponics system near Linz, Upper Austria, combining fish and vegetable cultivation in a symbiotic agricultural setup. While their business model is already inherently sustainable, FeldOASE was interested in exploring additional tools and potential collaboration opportunities to further develop their approach.

During the session, several tools were introduced, including the Business Model Canvas,

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Life Cycle Assessment (LCA), Lego Serious Play, and the Circularity Compass. This marked FeldOASE's first encounter with these circularity-focused methods, and the discussion provided new insights into how such tools could support and shape their evolving business model.

One of the key challenges identified was the company's early stage and agricultural focus, which currently offers limited direct overlap with the chosen Cradle-ALP industries such as packaging. FeldOASE is currently more in need of research-oriented partnerships than industrial ones.

A valuable takeaway from this consultation is that micro-enterprises—despite their openness to new ideas—often lack the capacity and resources to engage deeply with circularity tools at such an early stage. Future support formats may need to be more flexible and tailored to meet the needs of companies still establishing their foundations.

Conclusion and lessons learnt

Throughout the piloting phase of WP2, several overarching challenges became apparent. Finding suitable companies to participate was difficult, primarily because the tools and their purpose are not easy to explain in simple terms. Additionally, the ongoing economic pressures meant that many companies lacked the necessary time and resources to engage in activities perceived as non-essential. While there was general interest in the tools, this interest was mixed. The tools themselves tend to be somewhat superficial and are most effective only when a company is at a very specific stage in its development—reflective enough to recognize the value of strategic tools, but not yet so advanced that the content feels too basic. This "sweet spot" was challenging to identify, and as a result, outreach efforts were not always successful.

Where tools were applied, they typically served as a helpful first step, offering an initial orientation or diagnostic. However, they often lacked the depth needed to produce substantial or actionable results. A good example is the Circularity Compass, which is effective at highlighting where improvements might be possible but falls short in offering concrete guidance on how to achieve those improvements—often the more complex question companies face. Despite these limitations, there was noticeable interest in the overall WP2 offering. Yet, the time and resource constraints on the side of companies led to fewer concrete activities than the general level of interest might have suggested. Another key insight from the process was the difficulty in ensuring sufficient training and understanding of the tools among project partners, which occasionally limited the quality and consistency of implementation.

Nr.	Company	Country	Tool/Activity	Partner	Date
1	Vresh/das Merch	AT	Circularity Compass	PP5	01.10.24

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2	HEROPak	AT	Circularity Compass	PP5	02.02.25
3	Imara	AT	Circularity Compass	PP5	02.02.25
4	Layonardo	AT	Circularity Compass	PP5	02.02.25
5	LawAI	AT	Circularity Compass	PP5	02.02.25
6	Romy Robotics	AT	Circularity Compass	PP5	02.02.25
7	FeuerZEUG	AT	Business Model Canvas	PP5	11.02.25
8	FeldOASE	AT	1:1 consultation	PP5	11.02.25
9	MissionPET	AT	Lego Serious Play	PP5	24.02.25
10	Chase	AT	Lego Serious Play	PP5	24.02.25
11	NGR	AT	Lego Serious Play	PP5	24.02.25
12	Sleade	AT	Lego Serious Play	PP5	24.02.25
13	GeoPolymer	AT	Lego Serious Play	PP5	24.02.25
14	HEROPak	AT	Lego Serious Play	PP5	24.02.25
15	AI Inspiration	AT	Lego Serious Play	PP5	24.02.25
16	Tech2B	AT	Circularity Compass	PP5	02.04.25
17	Fino	AT	Circularity Compass	PP5	04.04.25
18	FeuerZEUG	AT	Circularity Compass	PP5	04.04.25
19	Makarony Polskie	AT	Circularity Compass	PP5	04.04.25
20	OPG Vina Bazon	AT	Circularity Compass	PP5	04.04.25
21	Woom	AT	LCA workshop	PP5	28.04.25
22	Camo	AT	LCA workshop	PP5	28.04.25
23	Polymerwerkstatt GmbH	AT	LCA workshop	PP5	28.04.25
24	Coiss GmbH	AT	LCA workshop	PP5	28.04.25
25	Vienna Textile Lab	AT	Cirplex booth	PP4 + PP5	14. - 15.05.25
26	NaKu	AT	Cirplex booth	PP5	14. - 15.05.25

Table: Summary of SMEs and interested stakeholders supported by Biz-up

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5.6. PP 6 – UniSMART

All companies listed below were initially contacted via email and followed up by phone. A dedicated 1-hour online consultation was then scheduled with each of them. During these bilateral sessions, the Cradle-ALP project was presented, and the QuickScan tool was applied to assess their potential and interest in circular transformation.

Atlas Copco

- **Date:** 12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Atlas Copco demonstrates a solid commitment to sustainability and circularity with clear ambitions for future development, though several key initiatives, especially in circular design and value chain collaboration, remain in early stages and require further advancement.
- **Challenges:** Early-stage development of circular design and limited value chain collaboration.
- **Next steps:** Strengthen circular product development

Crocco

- **Date:**12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Crocco shows a clear ambition and good integration of circular principles, with effective use of recycled materials and energy initiatives, while continuing to develop product recovery and supply chain circularity.
- **Challenges:** Product recovery systems and full supply chain circularity.
- **Next steps:** Expand take-back initiatives and strengthen circular practices across the supplier network. The company will be invited to participate in upcoming project events and workshops to further support their journey toward circularity.

Fila Solutions

- **Date:** 11/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Fila Solutions shows strong strategic commitment to sustainability and circularity, with solid operational practices in place, though some areas like waste reuse and full production cycle closure still require development.

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- **Challenges:** Waste reuse and closure of the full production cycle.
- **Next steps:** Develop reuse pathways and improve tracking of material flows.

Fiorese Group

- **Date:** 12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Fiorese Group demonstrates strong strategic awareness and solid current sustainability practices but needs to advance its circular supply chain development and fully integrate circular design and digitalization to achieve its long-term circular business ambitions.
- **Challenges:** Limited circular supply chain development and lack of digital integration.
- **Next steps:** Digitalize circularity KPIs and co-develop circular solutions with suppliers.

Fitt

- **Date:** 16/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Fitt Spa demonstrates solid strategic awareness and commitment to sustainability and circularity, with strong operational practices in resource efficiency and waste reduction, while facing challenges in product end-of-life recovery and full systemic integration, yet showing clear ambition and ongoing progress toward a more circular business model.
- **Challenges:** Product end-of-life recovery and full systemic integration.
- **Next steps:** Strengthen recovery systems and advance integration of circularity across the entire product lifecycle.

Inovance

- **Date:** 12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Inovance shows strong commitment and clear vision in sustainability and circularity, with significant progress made and focused opportunities for further development in closing material loops and expanding circular business models.
- **Challenges:** Closing material loops and expanding circular practices across the value chain.
- **Next steps:** Enhance take-back systems and scale circular models to additional product lines.

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Irinox

- **Date:** 12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Irinox demonstrates clear commitment and ambition towards sustainability and circularity, though further progress is needed to fully integrate circular practices into its operations and supply chain.
- **Challenges:** Operational integration of circular practices.
- **Next steps:** Develop supplier engagement strategies and internal circularity KPIs.

Kering Eyewear

- **Date:** 16/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Kering Eyewear shows strong ambition and initial progress toward circularity, yet significant opportunities remain to fully embed sustainable practices across operations and value chains.
- **Challenges:** Full operational and value chain integration of circularity.
- **Next steps:** Extend design-for-circularity principles and implement closed-loop systems. The company will be invited to participate in upcoming project events and workshops.

Labomar

- **Date:** 12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Labomar demonstrates solid strategic commitment to sustainability and circularity, yet significant operational progress remains essential to fully realize its ambitions.
- **Challenges:** Operational implementation of circular initiatives.
- **Next steps:** Develop circular product lines.

Metal Work

- **Date:** 12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Metal Work Service Vicenza demonstrates strong strategic and operational foundations in sustainability and circularity, though it needs to strengthen material recovery and fully integrate circular design to complete its transition to a circular business model.
- **Challenges:** Material recovery and circular design integration.

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- **Next steps:** Implement circular design standards and expand recovery initiatives.

UniGb

- **Date:** 12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Unigb demonstrates strong strategic awareness of sustainability and circularity, yet still has significant room for operational integration and supply chain collaboration to fully realize its circular ambitions.
- **Challenges:** Limited operational and supply chain circularity.
- **Next steps:** Introduce supply chain engagement strategies and monitor material flows.

Ursus

- **Date:** 12/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Ursus shows strong strategic commitment and initial operational progress in sustainability and circularity, yet still faces significant challenges in scaling circular practices across the entire value chain.
- **Challenges:** Scaling circularity across production and supply.
- **Next steps:** Pilot closed-loop systems and improve supplier collaboration.

Pietro Fiorentini

- **Date:** 16/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Pietro Fiorentini demonstrates strong strategic awareness of sustainability but still has significant room for improvement in operational circularity, especially regarding recycled materials, end-of-life recovery, and supply chain collaboration.
- **Challenges:** Use of recycled materials, end-of-life recovery, and supply chain circularity.
- **Next steps:** Increase use of secondary raw materials. The company will be invited to participate in upcoming project events and workshops.

Prearo Costruzioni

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- **Date:** 16/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Prearo Costruzioni Srl demonstrates solid commitment and initial actions toward sustainability and circularity, yet still faces significant challenges in fully integrating circular practices across its value chain.
- **Challenges:** Comprehensive value chain circularity.
- **Next steps:** Map circularity potential across suppliers and standardize material choices.

Piano Green

- **Date:** 17/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Piano Green demonstrates a strong strategic commitment to sustainability and circularity, with clear progress and ambitions supported by advanced practices and collaborative approaches to fully integrate circular economy principles into its business model.
- **Challenges:** Ensuring full-scale implementation and systemic alignment.
- **Next steps:** Scale circular pilots, strengthen partnerships and monitor system impacts.

Hitachi Energy

- **Date:** 17/06/2025
- **Tool used:** QuickScan
- **Status:** enrolled
- **Summary:** Hitachi Energy shows strong strategic commitment and promising progress towards circularity but still faces challenges in scaling recycled materials and fully closing production loops.
- **Challenges:** Scaling recycled materials and closing production loops.
- **Next steps:** Improve internal recycling systems and material circularity metrics.The company will be invited to participate in upcoming project events and workshops.

#	Company	Country	Tool/Activity	Partner	Date
1	Atlas copco	IT	QuickScan	PP6	12/6/25
2	Crocco	IT	QuickScan	PP6	12/6/25
3	Fila Solution	IT	QuickScan	PP6	11/6/25
4	Fiorese Group	IT	QuickScan	PP6	12/6/25

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5	Fitt	IT	QuickScan	PP6	16/6/25
6	Inovance	IT	QuickScan	PP6	12/6/25
7	Irinox	IT	QuickScan	PP6	12/6/25
8	Kering	IT	QuickScan	PP6	12/6/25
9	Labomar	IT	QuickScan	PP6	12/6/25
10	Metal work	IT	QuickScan	PP6	12/6/25
11	Unigb	IT	QuickScan	PP6	12/6/25
12	Ursus	IT	QuickScan	PP6	12/6/25
13	Pietro Fiorentini	IT	QuickScan	PP6	16/6/25
14	Prearo	IT	QuickScan	PP6	16/6/25
15	Piano Green	IT	QuickScan	PP6	17/6/25
16	Hitachi Energy	IT	QuickScan	PP6	17/6/25

Table: Summary of SMEs and interested stakeholders supported by UniSMART

Conclusions and lessons learnt

Between November and December, our project team reached out to 25 companies, primarily small enterprises (1–15 employees). We employed a combination of email introductions and follow-up phone calls to invite these companies to participate in our initiative. Despite our significant effort, the response was minimal. Only one company provided any meaningful feedback, and even that prospective collaboration was discontinued after the initial contact. This lack of engagement could have been interpreted as reluctance or disinterest. However, instead of viewing it negatively, we treated it as valuable feedback on our approach and an opportunity to refine our strategy.

In the next phase (April to June), we adjusted our outreach strategy based on our earlier experience. First, we offered more facilitated support to make participation easier – for example, providing clearer guidance, resources, or personal assistance to lower the barrier for companies to get involved. Second, we expanded our target group beyond small businesses. We reached out to an additional 17 companies, this time including medium and large enterprises, to diversify our pool of potential collaborators. Our communications were more detailed and tailored: along with emails containing comprehensive project information, we made direct phone calls to key contacts in each organization to personally explain the project's value. Despite these improvements and a broader target audience, we still did not receive positive responses from the external companies. This outcome indicated that the challenge lay deeper than just our outreach method or the company size – it pointed towards issues like trust, relevance, or timing that we needed to consider.

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In parallel with the above efforts, we turned to companies within the UniSMART community: the difference in reception was remarkable. Companies in our network were open and interested in our project; many responded positively and agreed to experiment with our QuickScan tool as part of the project. By leveraging this trusted network, we quickly gained enthusiastic participants willing to collaborate and provide feedback. This contrast reinforced the idea that an existing rapport or endorsement can significantly improve stakeholder engagement.

Conclusions from Quickscan Sessions

The one-to-one sessions conducted using the Quickscan tool revealed that participating companies possess a strong and widespread awareness of circular economy principles. All companies acknowledged their familiarity with circularity concepts and expressed a clear intention to integrate these practices more systematically into their strategies and operations. A distinct strategic ambition was evident, as companies presented well-structured internal roadmaps with clearly defined objectives, timelines, and actionable next steps.

However, the primary challenges lie in the practical implementation of circular economy principles. These challenges stem from sector-specific characteristics, where each supply chain faces unique technical, regulatory, or market barriers, complicating the transition from ambition to tangible results.

A recurring theme was the emphasis on packaging, where all companies reported partial adoption of recycled materials or more sustainable solutions. Despite this, there remains significant potential for further innovation in this area.

In terms of business models, those based on circular design and long-life principles emerged as the most promising and attractive. Many companies have already initiated concrete projects in this direction and plan to extend these approaches to all newly developed products in the medium term. On the other hand, the redesign of existing products is a more complex and gradual process. Technical constraints and adaptation costs pose challenges, requiring longer timelines and careful planning.

In conclusion, while participating companies demonstrate clear ambition, well-defined priorities, and relevant experience, they require targeted support to overcome operational hurdles and accelerate their transition to fully circular business models.

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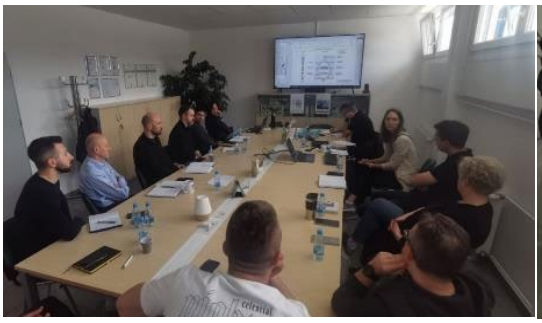
5.7. PP 7 – CCIS

Regarding individual activities, CCIS focused mainly on the Circularity Compass and the Sustainable Business Model Canvas. The approaches to individual piloting varied, ranging from site visits to inviting companies to the CCIS premises. These approaches depended on several factors, including the company's willingness to participate, the number of employees involved (whether a larger group or just one or two individuals), as well as the opportunities or preferences expressed by the companies.

Circularity Compass

- The core activity of **Termoplasti - Plama d.o.o.** is the production of printed and unprinted, flexible packaging, primarily made of polyethylene. The leadership and the experts decided to join us for this workshop and rethink their production in a more circular and cradle to cradle way. The workshop took place on February 16th.




- **Maar d.o.o.** works in the field of plastic net production. Their production program covers virtually all needs for packaging materials, especially packaging nets. As one of the few manufacturers in the world, they offer both welded (extruded) nets and knitted nets. Still, they decided to respond to our invitation to the individual piloting activity "Circularity Compass", as they firmly believe there is always room to improve their circularity in production facilities. The workshop took place twice (March 26th and April 15th) because it went in such a detail.



- **RotoECO d.o.o.** is an internationally recognized company in the field of rotomoulding, with a strong focus on the development and production of solutions

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for recycling and water self-sufficiency. The company's growth is driven by continuous innovation, new technologies, and materials developed in collaboration with scientific institutes, universities, and other companies. With this mentality, they decided to take part in Circularity Compass Workshop – to improve their production even more. The workshop took place on February 20th.

- **Turnaplast d.o.o.** is a development supplier of advanced plastic product and component solutions, including packaging, based on innovative technologies. They provide high-quality plastic products that meet the highest aesthetic standards. We conducted the workshop with them on April 18, 2025.

- **O.P.S. BREZNIK d.o.o.** is an innovative company specialized in the development and production

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of high-quality components for the automotive industry. Their approach combines a comprehensive range of services – from initial design and development prototypes to serial production and delivery of final products. The workshop took place on April 24th.

- **Energetsko svetovanje s.p.** is a company by Nevia Paulić who worked in the paper industry for more than 10 years. After that, she decided to step away and start advising paper mill companies on energy efficiency. When she saw our advertisement for the piloting activity, she decided to apply and share this new knowledge with her clients. Since the paper mills did not respond to our invitations, we were happy to carry out the piloting with Ms. Paulić, who is a nationally recognized expert in the paper mill sector. The workshop took place on March 12th.

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- **JB Energija d.o.o.** is a company that brings together experienced and professionally trained individuals in the field of renewable energy. Their expertise and extensive experience, gained both in Slovenia and abroad, are focused on developing innovative approaches for the efficient and sustainable use of solar energy. Their team—composed of engineers, project managers, and technical specialists—provides high-quality services in the planning and installation of solar power plants, while remaining committed to reliability, professionalism, and customer satisfaction. As part of our collaboration with the company, we spoke with the project manager about potential improvements in their production and supply processes. The company is actively working to align its operations with cradle-to-cradle principles, aiming to optimize energy and material use while reducing environmental impact. Special attention is also being given to packaging, as they have recognized its significant influence on the overall sustainability of their solutions. They are currently exploring options to replace existing packaging materials—such as plastic, styrofoam, and bubble wrap—with more environmentally friendly alternatives, including recycled or reusable cardboard and biodegradable materials. In doing so, they aim to ensure that packaging not only fulfills its transport function but also complies with circular economy guidelines and relevant environmental legislation. The workshop took place on June 19, 2025.



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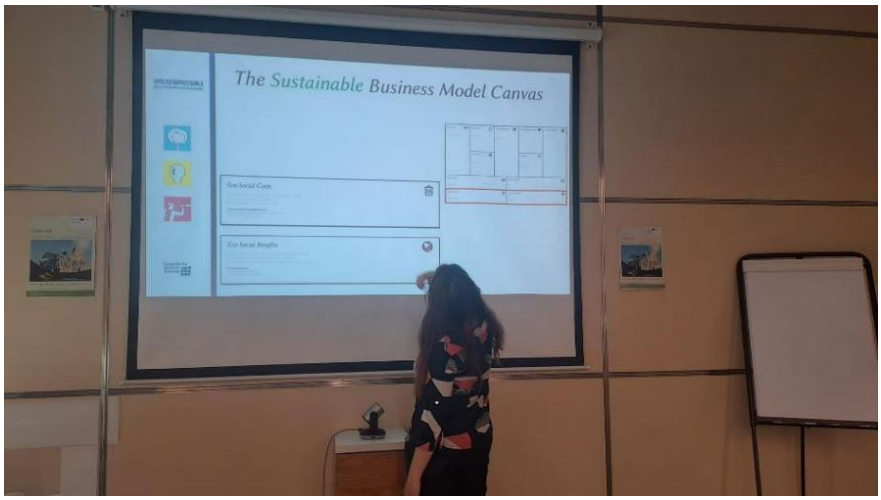
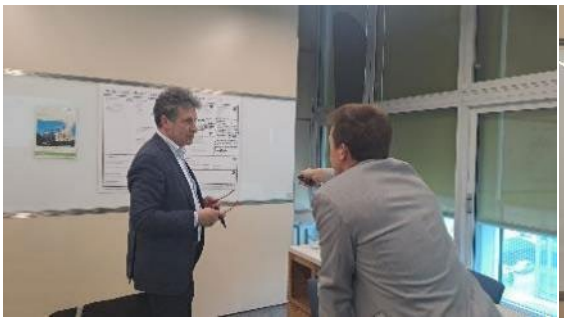
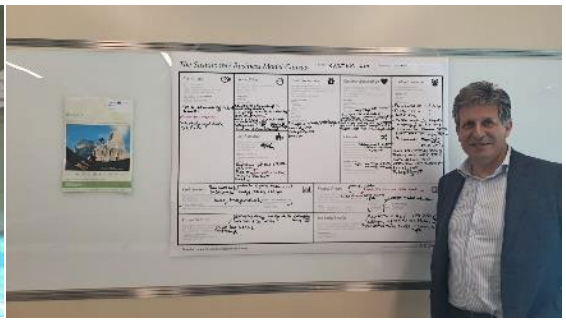
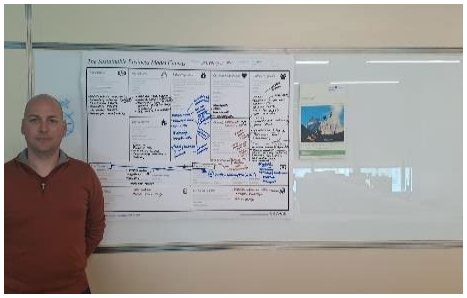
Sustainable Business Model Canvas



- **Kartem d.o.o.** is specialized in the production of various types of corrugated cardboard packaging and a synonym for cardboard packaging on the Slovenian market. They have established a strong presence across all industries with packaging needs – from the food and processing industries to the automotive and chemical sectors.

- **CPS Project d.o.o.** is a young Slovenian company, established with the goal of developing circular and sustainable packaging solutions. Although the company has not yet started production, their aim is to launch manufacturing by the end of this year. In the future, they plan to offer customized solutions for the food, cosmetics, and industrial sectors, with a strong focus on sustainable development. Their mission is to reduce environmental impact by using renewable raw materials and advanced technologies to create eco-friendly materials and promote a circular economy. This is also the reason why they decided to do the piloting with us.

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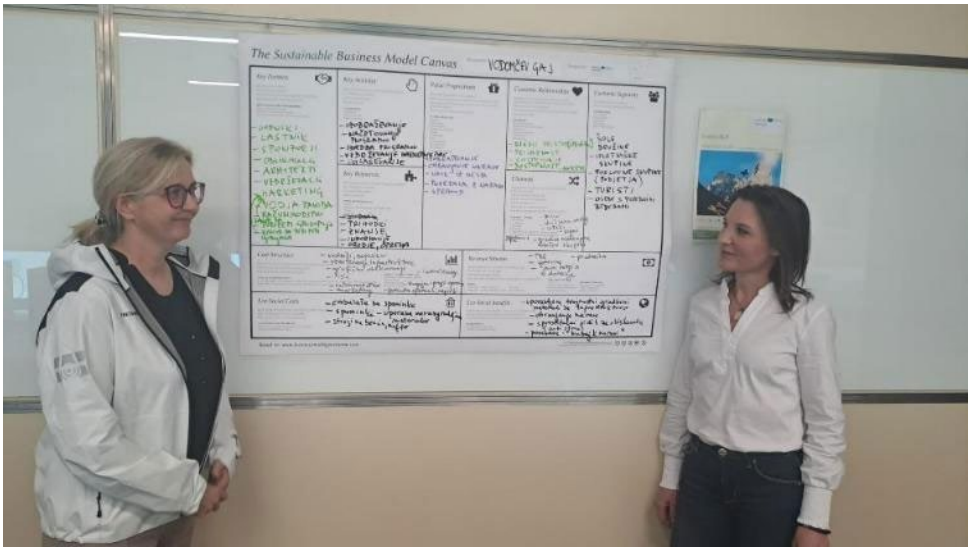
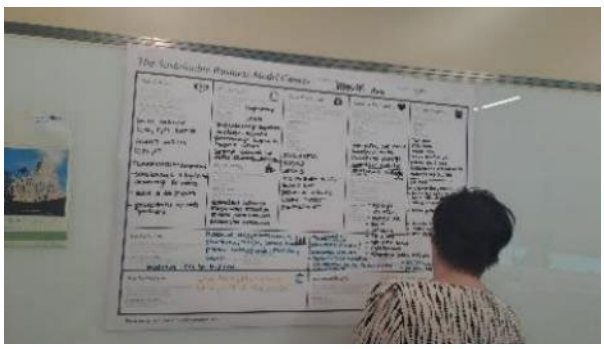
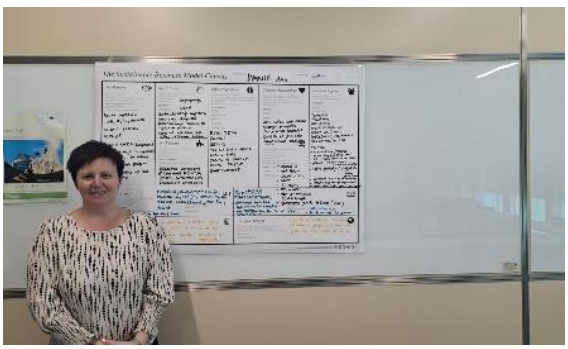
- **Zavod Vodomčev gaj** is by far the most unique SME we piloted with. It is a private organization that manages a natural mosaic of wetlands, meadows, forest edges, orchards, and streams, through which a 5-kilometer circular educational trail called "In the Footsteps of the Kingfisher" runs. The area is significant for its high biodiversity and is especially known for its many bird species, including rare and endangered ones. As the organization's mission is to raise awareness about the importance of biodiversity and nature, they aim to demonstrate through circular approaches how business can be done with green solutions. Therefore, they decided that all products sold in their gift shop will be offered exclusively in sustainable packaging. Both the director and the packaging designer attended the workshop to learn new approaches to their business model and how to "sell the packaging".



- **Jamnik d.o.o.** is a family-owned company, established in 1988. Its core activity is the production and marketing of printed packaging. The workshop was attended by the Sales Director, who was initially somewhat skeptical. However, by the end, she expressed regret that her colleagues had not participated as well.





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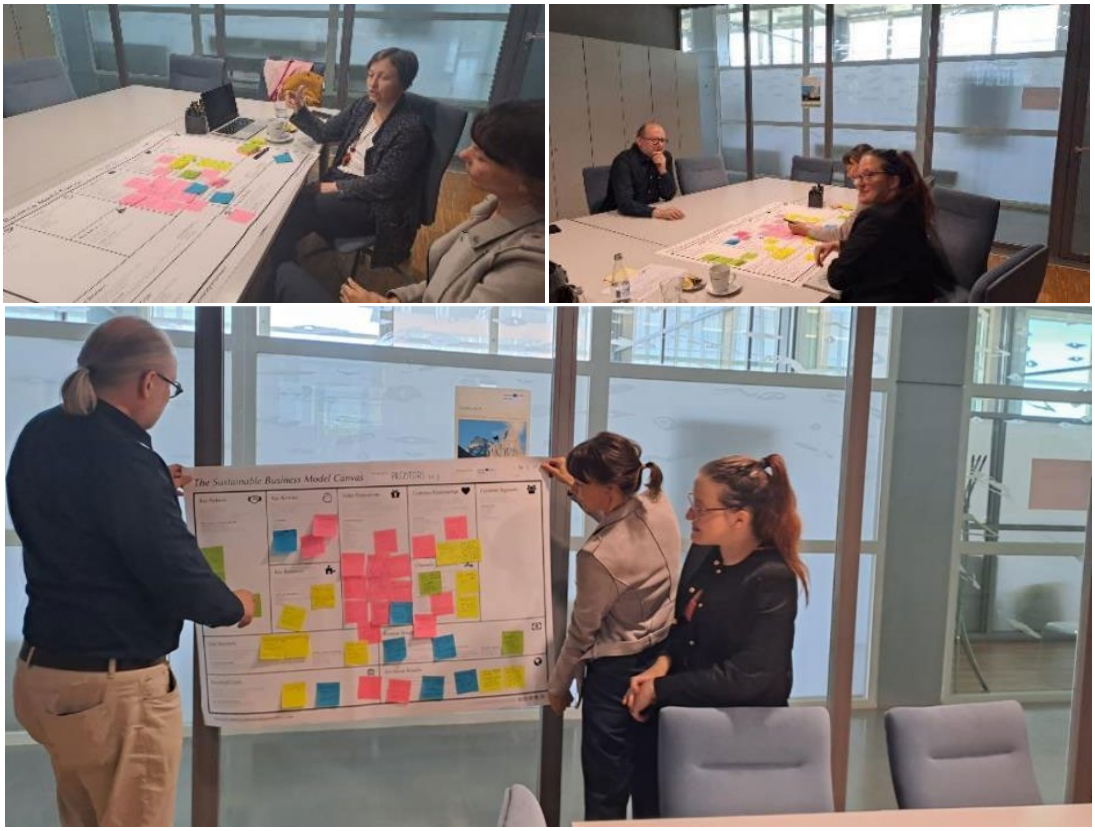
- **Zavod Prostori** is a small start-up dedicated to encouraging sustainability, education, culture and international cooperation. They have embraced the challenge of demonstrating that high-quality products can be achieved using waste materials. For this reason, they are working on a biodegradable textile paper material that could be used for different purposes, from packaging to textile solutions.



- **Zavod HexHaus** was founded by media artists Anže Sekelj and Staš Vrenko. The organization functions as a collaborative platform for the development of experimental electronic instruments, drawing on the founders' extensive experience in media arts, multimedia installations, and the design of artistic tools. HEX HAUS designs and produces a line of electronic devices known as HEX instruments. These instruments are conceived as educational, artistic, and performative tools that merge sound-making with play and exploration. The core aim of the project is to develop didactic, affordable, portable, and intuitive electronic instruments that transcend conventional boundaries between music production, creative experimentation, and educational practice. HEX instruments are specifically designed with sustainability, accessibility, and versatility in mind. All components are fully replaceable and repairable, supporting users' right to repair and ensuring the longevity of each device. Still, the duo wanted to explore further possibilities for addressing and implementing sustainability within their

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business model and therefore chose to participate in our piloting activities. Their primary objective is to identify and incorporate more sustainable alternatives to the currently used polymer-based materials. The workshop took place on **June 26, 2025**.

- **Additio d.o.o.** is a young Slovenian company with a vision to become a leading development partner in the field of additive technologies and metallurgy in Slovenia and beyond. With a unique combination of rapid metal casting model production using 3D fused filament fabrication technology and strong partnerships with foundries, we aim to deliver high-quality products to our customers in the shortest possible time. At the same time, we strive to leverage our in-depth knowledge of materials to offer suitable engineering solutions for every application. Additio d.o.o. is a distributor of industrial 3D printers from BigRep, Epitum, VShaper, and Nexa3D, as well as additive materials from BASF Forward AM. Our website, 3DTisk.si, is intended for direct ordering of 3D-printed products and for testing additive materials from our portfolio. We also offer post-processing services, such as sandblasting, painting of parts, and more. One of our business units specializes in FDM printing and office use, while the other is focused on MSLA technology and is equipped with devices for final part finishing. In addition to industrial 3D printing, we focus primarily on the development of new products manufactured using additive technologies, as well as the practical application of additive materials. We conducted the workshop with the company's director online, as the geographical distance on one hand and his busy schedule on the other contributed to prolonged coordination. Ultimately, we agreed to hold the workshop virtually. The workshop took place on June 26, 2025.

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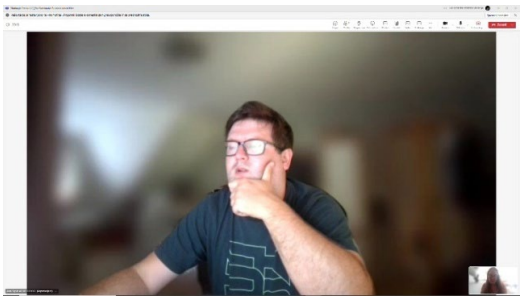

#	Company	Country	Sector	Tool/Activity
1	Termoplasti - Plama d.o.o.	SLO	Packaging	Circularity Compass
2	Maar d.o.o.	SLO	Packaging	Circularity Compass
3	RotoECO d.o.o.	SLO	Packaging	Circularity Compass
4	Turnaplast d.o.o.	SLO	Packaging	Circularity Compass
5	O.P.S. BREZNIK d.o.o.	SLO	Packaging	Circularity Compass
6	Energetsko svetovanje s.p.	SLO	Packaging	Circularity Compass
7	JB Energija d.o.o.	SLO	Packaging	Circularity Compass
8	Kartem d.o.o.	SLO	Packaging	SBMC
9	CPS Project d.o.o.	SLO	Packaging	SBMC
10	Zavod Vodomčev gaj	SLO	Packaging	SBMC
11	Jamnik d.o.o.	SLO	Packaging	SBMC
12	Zavod Prostori	SLO	Packaging	SBMC
13	Zavod HexHaus	SLO	Packaging	SBMC
14	Additio d.o.o.	SLO	Packaging	SBMC

Table: Summary of SMEs and interested stakeholders supported by CCIS

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Conclusion and lessons learnt

During the piloting phase of the Cradle-ALP project, some challenges naturally emerged, as is often the case when introducing new tools and approaches, such as the Circularity Compass and the Sustainable Business Model Canvas, to a diverse group of small and medium-sized enterprises. Initially, it proved somewhat demanding to attract the attention of companies through general outreach methods, including newsletters, social media campaigns, and website updates. The tools developed within WP2 required a certain degree of explanation and contextualisation, which meant that their value was not always immediately apparent through broad communication channels alone.

At CCIS, it became clear early on that a more personal and relationship-driven approach would be essential. By engaging companies directly, through phone calls, individual emails, personal invitations, and even on-site visits, we were able to present the tools in a way that clearly aligned with the specific challenges and opportunities facing each company. This tailored approach proved highly effective, as companies responded positively once the relevance and potential impact of the tools were made tangible. In many cases, initial skepticism gave way to genuine interest and engagement once the piloting activities began. Some participants even expressed regret that more of their colleagues had not joined the sessions, and in one case, a company requested a follow-up workshop due to the practical value of the first session.

One of the more sector-specific challenges encountered during the piloting activities was the difficulty in engaging companies in the textile industry. Despite multiple outreach efforts, including a personal invitation from the Director of the Textile Chamber, there was limited response. In contrast, other sectors demonstrated a clearer interest in the topic of circularity.

Across the piloting activities, companies benefited in multiple ways. They gained new perspectives on how to approach sustainability through circular business models and identified concrete steps they could take to improve their environmental performance. The discussions created an important space for strategic reflection, enabling companies to view sustainability not just as a compliance issue, but as a business opportunity.

These successes were made possible through the strong collaboration and mutual support among Cradle-ALP project partners. The transnational sectoral working groups provided a critical platform for experience sharing, mutual learning, and coordinated action. By regularly exchanging insights and adjusting our approaches based on shared experiences, the consortium created an adaptive and supportive framework that facilitated meaningful SME engagement across regions and sectors.

Once SMEs became involved, their feedback consistently confirmed the relevance of the tools. Companies such as Maar and Termoplasti successfully applied the Circularity Compass to assess their production processes, while others like Additio and HexHaus used the Sustainable Business Model Canvas to explore how sustainability could be embedded into their core business models. CPS Project and Kartem joined because the

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initiative directly aligned with their long-term development strategies, while companies such as Jamnik discovered new directions through their participation.

Ultimately, the piloting activities demonstrated that even initially hesitant companies can become active supporters of circular practices when approached with the right message, timing, and level of personal engagement. The commitment of the project partners, combined with the flexibility to tailor the tools and support to local contexts, played a key role in ensuring that each company could find its entry point into the circular economy.

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5.8. PP 8 – POL

Direct matching :

- *Geneomat & French industrial group in the medical sector*

  As part of the Cradle ALP initiative to foster circular economy collaborations across the Alpine space, a major French industrial group in the medical sector, based in the Auvergne-Rhône-Alpes region, was connected with GENEOMAT, a specialized SME.

  GENEOMAT is a French SME with expertise in materials, recycling, and packaging solutions. The company supports industrial partners in the development of new concepts and innovative products, integrating eco-design and circularity principles from the early stages. With deep technical know-how and a strong understanding of material flows, GENEOMAT plays a key role in enabling sustainable solutions.

  This connection aims to explore the creation of a dedicated value chain for recycling single-use protective equipment, such as gowns, caps, gloves, and overshoes, which are currently mostly landfilled after use. Several discussions have already taken place with the group's quality and procurement departments, focusing on feasibility, regulatory compliance, and logistics.

  Ongoing exchanges seek to build a broader consortium, including the industrial group, GENEOMAT, as well as the equipment supplier and current waste collector, with the ambition of transforming the existing linear model into a circular one. This initiative aligns closely with European waste reduction goals and offers strong potential for replication.

Presentation of a company's solution during members' working group meeting

On February 20, 2025, POLYMERIS organized a new edition of the Materials Life Cycle Club, bringing together industrial stakeholders to discuss challenges related to eco-design, life cycle assessment (LCA), and recycling processes. This event fostered the exchange of best practices and showcased technological innovations supporting the circular economy.

In this context, the French startup MOB-E-SCRAP presented its innovative delamination technology. Founded in 2021, MOB-E-SCRAP was established to develop a Swiss delamination technology invented in the 1990s by one of its founders. This patented and proven technology has led to the construction of over 20 plants worldwide since 1995.

The process is based on a physical principle that subjects multilayer materials to high-intensity impacts (up to 5000 G) at a high frequency (up to 6000 impacts per second). Due to differences in density, plasticity, and ductility, the material layers behave differently under impact, and in most cases, the interface fails under shear stress.

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MOB-E-SCRAP presented its process to about twenty industrial participants, including MAPED SAS, CAPACITÉS SAS, Groupe SEB, Bobine, ECOLOGIC, Lab PLASTICS, Michelin, Clayens, S2P, ARAYMOND, MONOMERIS CHEMICALS, GAINOPLAST, Valeo LIGHT, Environnement Recycling, IDELAM, Pack Avenir, MEYGATECH.

The presentation was well-received and sparked numerous questions from participants, highlighting strong interest in the technology's potential to address current challenges in recycling and processing composite and multilayer materials. Groupe SEB showed particular interest in the process, opening opportunities for future discussions and potential collaborations.

Circularity Compass

Circularity Compass workshops were organised to help businesses and organizations map and visualize resource flows across different stages of a product's lifecycle. It is a structured method to launch discussions on circularity between participants and collectively identify solutions to minimise waste of resources and materials at each stage of the production and commercialisation process.

- *Circularity Compass workshop POL*

Polymeris organized on the Nov. 5th, 2024 a two hours Circularity compass workshop on plastic packaging at the National Recycling Colloquium Gala, co-organised by Axelera (Auvergne-Rhône-Alpes Chemical Cluster), Techtera (Auvergne-Rhône-Alpes Textile cluster) and Polymeris.

Guided by the Circularity Compass model, participants explored each stage in the life cycle of a plastic product, from molecule to finished product, and together identified concrete avenues for optimising the use of resources, minimising waste and rethinking the product's end-of-life.

7 SMEs from the plastic and textile industry, one cluster and one university attended the workshop. Because of the diverse representation of the value-chain among the participants (recyclers, manufacturers of plastics, R&D consulting firms) and thanks to their complementary knowledge on circularity, recycling technologies, logistics, business models, the workshops enabled them to share the different issues and solutions possible to improve circularity of a plastic packaging for yogurt. It was a great way to launch discussions between them and connect recyclers and consulting firms with manufacturers that were encountering issues in recycling their plastic waste.

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Conclusion and lessons learnt

One of the main challenges observed during the piloting activities was the difficulty in finding companies willing to participate, especially in certain sectors. For example, the textile sector did not respond to invitations, although (among other tries) the Director of the Textile Chamber personally invited them. In other sectors, CCIS experiences showed that interest in the topic of circularity and sustainability was present, although the strongest motivation for participation often came from anticipated legislative changes, rather than purely from internal initiative or curiosity. We have decided to incorporate this topic also in our workshops.

At first, many companies approached the tools with a degree of skepticism. However, once they engaged in the workshops and piloting sessions, this skepticism often turned into strong interest and enthusiasm. Some companies expressed regret that more of their colleagues had not taken part in the activities, showing that the value of the tools became clearer during hands-on application. One company even requested a repeated session due to the usefulness and depth of the workshop.

Overall, companies benefited from the piloting activities, particularly by gaining new perspectives on circular business models, environmental reporting (e.g., ESRS), and the potential for improved sustainability performance in their manufactures. The tools helped companies identify practical steps toward more circular operations, and the discussions created space for reflection on both environmental and strategic dimensions of their work.

The piloting phase showed that with the right approach and timing, even initially hesitant companies can become active supporters of circular economy practices. The experience confirmed that personal engagement and a connection to real regulatory needs are key to meaningful participation.

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#	Company	Country	Sector	Tool/Activity
1	Excoffier	FR	Polymers	Circularity Compass
2	EUROPROTEC	FR	Polymers	Circularity Compass
3	BPMT Conseil	FR	Polymers	Circularity Compass
4	Clayens	FR	Polymers	Circularity Compass
5	SAO	FR	Textile	Circularity Compass
6	Gainoplast	FR	Polymers	Circularity Compass
7	PREMCA	FR	Polymers	Circularity Compass
8	Extracthive	FR	Polymers	Matchmaking event Composites
9	Plastic at Sea	FR	Polymers	Matchmaking event Composites
10	IPC	FR	Polymers	Matchmaking event Composites
11	Polyloop	FR	Polymers	Matchmaking event Composites
12	OLNICA	FR	Polymers	Matchmaking event Composites
13	STERIMED	FR	Polymers	LCA event
14	SIMCON France	FR	Polymers	LCA event
15	FORVIA	FR	Polymers	LCA event
16	TRELLEBORG	FR	Polymers	LCA event
17	Bobine	FR	Polymers	LCA event
18	CorpoKarma	FR	Polymers	LCA event
19	Si-2-Si	FR	Polymers	LCA event
20	ARAYMOND	FR	Polymers	LCA event
21	CT IPC	FR	Polymers	LCA event
22	KAPSTAN	FR	Polymers	LCA event
23	CGP Industries	FR	Polymers	LCA event
24	Polyloop	FR	Polymers	LCA event
25	NEO-ECO	FR	Polymers	LCA event

Table: Summary of SMEs and interested stakeholders supported by Polymeris

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5.9. PP 9 - HEIA-FR

HEIA-FR's aim of this period of the Cradle-ALP project was to pilot the Value Chain Generator Tool (VCG) in the larger context of an ongoing development of a bio-based circular economy strategy in the canton of Fribourg. The region has an important agrifood sector and decided to focus on smart specialization opportunities for added value in the field of the bioeconomy. Its dynamic bioeconomy ecosystem consists of companies, clusters and specialized research institutes (Factsheet Bioéconomie, Canton de Fribourg, 2024).

Home to 10 institutes of applied research and development, HEIA-FR is a key player in the regional innovation ecosystem. As such, it aims at playing an active role in the regional circular transition through collaborative innovation projects with regional businesses. The challenge faced by the region is to turn strategic goals and opportunities into concrete bankable innovation projects for the valorization of regional biomass. The Cradle ALP project was an ideal platform to team up with the Stuttgart based start-up VCG.AI in order to address the identified challenge and take an important step forward in the concretization of circular transition opportunities.

VCG.AI proposes AI and advanced data solutions (the VCG tool) to develop profitable business opportunities and support for regions in accelerating the transition to a circular economy across supply chains. Within the Cradle ALP project, three distinct actions will be piloted in collaboration with VCG.AI:

- Presentation of best practice case studies from the VCG network to interested businesses and research institutes in order to stimulate direct matching
- VCG analysis of biomass valorization pathways to identify feasible regional solutions involving HEIA-FR research fields
- Series of workshops with companies and research institutes to connect partners in the most promising value chains and develop circular transition projects

Direct matching based on VCG case studies:

In collaboration with VCG.AI, three case studies were submitted to the aR&D institutes of HEIA-FR in order to raise awareness for circular transition opportunities and investigate options for the development of innovation projects through direct matching.

- Case study I: identifying the optimal solution for dairy industry side streams (Figure 1)

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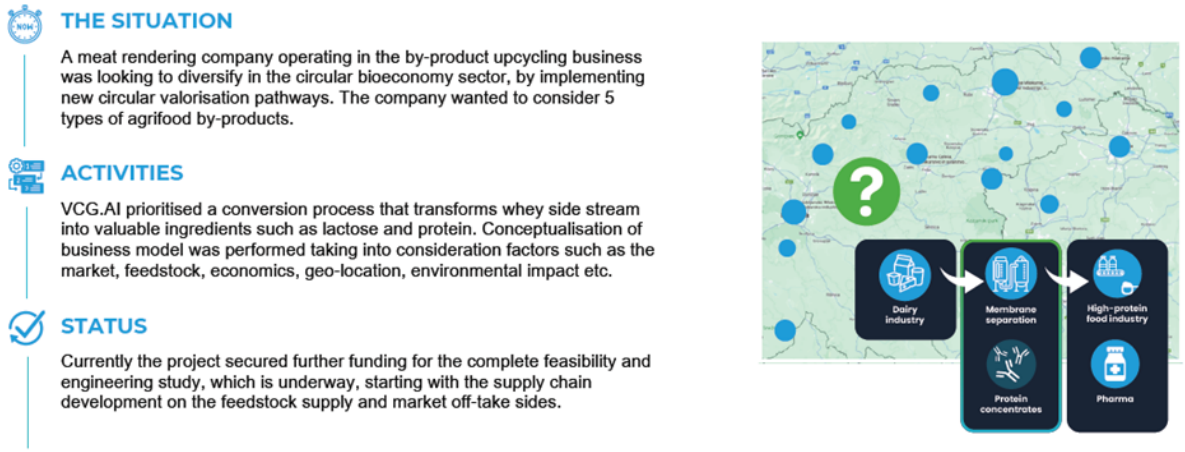
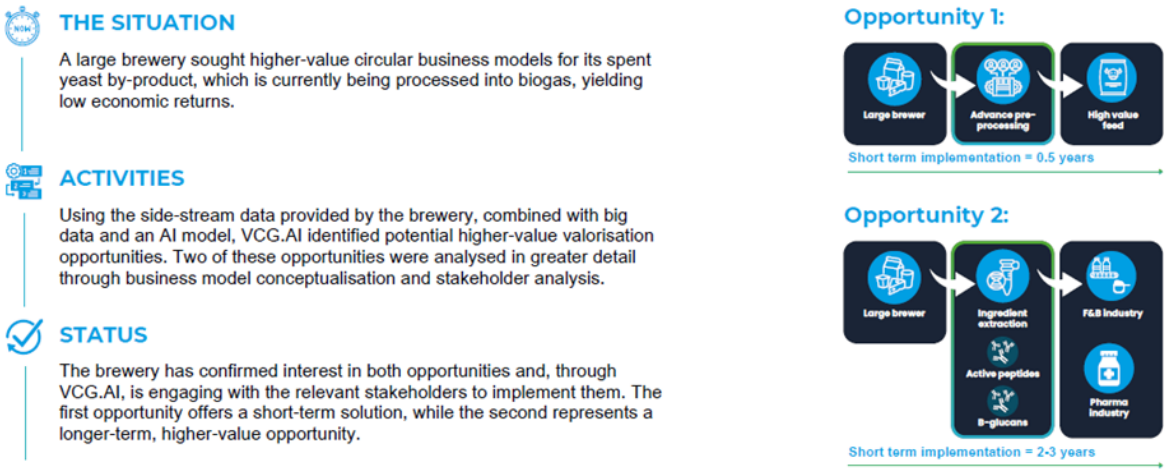
Figure 1: Case study - dairy industry side streams



Source: VCG.AI (2024)

- Case study II: identifying solutions for brewer's spent yeast

Figure 2: Case study - brewer's spent yeast



Source: VCG.AI (2024)

- Case study III: valorization of whey permeate with microalgae

Figure 3: Case study - whey permeate with microalgae

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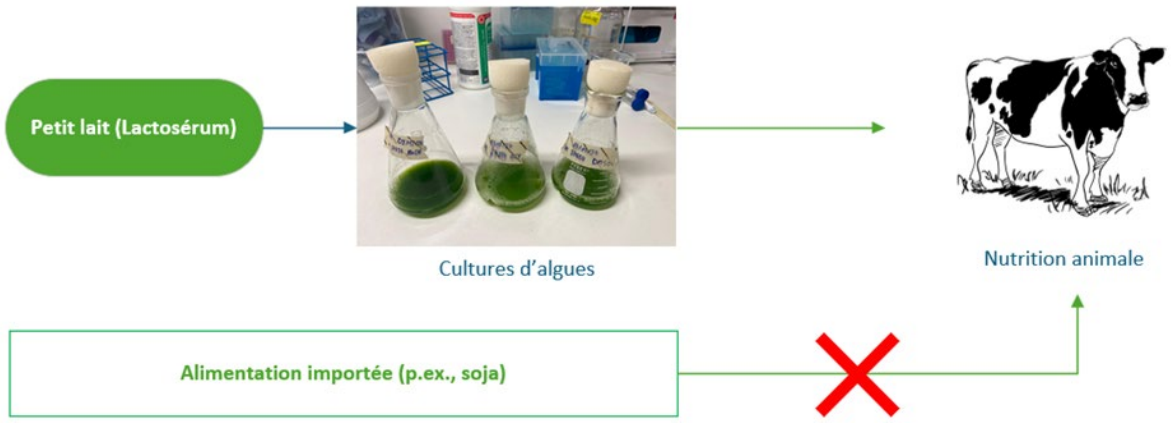

Source: CHEMTECH (2025)

All three case studies raised the interest of several research institutes with the biggest potential for immediate action identified in the field of the valorization of whey permeate with microalgae (case study III). Whey permeate, often considered as a waste product, is rich in nutrients but poses environmental challenges when discarded. Microalgae offer a promising solution to transform this byproduct into valuable products such as proteins and lipids for the food industry. HEIA-FR decided to take immediate action on this opportunity:

- **Action I**: Financing a synchronized call for projects together with HEIA-FR's partner school HEG Fribourg (School of Management Fribourg).
  - Status: completed in May 2025.
  - Through this call, a joint research project for 50'000 CHF was financed, supporting a collaboration between HEIA-FR's research institute CHEMTECH and HEG's Food Ecosystem Institute. The research focused on the screening of several microalgae strains to evaluate their growth performance and yields on whey permeate-based media. The project confirmed the potential for industrial scale-up and resulted in the definition of a follow-up project involving industrial partners from the region:
    - A local dairy industry business has been identified as a whey supplier
    - Agroscope and CHEMTECH confirmed the possibility for microalgae cultivation, in-vitro analysis and testing
    - Local industrial equipment providers have confirmed the possibility of mechanical lysis and hydrolysis of algae
    - A large Swiss multinational food and drink processing company has confirmed interest for further collaboration

Value Chain Generator (VCG) analysis :

To support HEIA-FR in its objective to identify valorization opportunities for the bio-

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based circular economy in the region, VCG.AI leveraged advanced data analytics and algorithms to propose feasible value chains involving HEIA-FR's research institutes. VCG.AI is able to access a multitude of data points on bio-feedstocks, transformation technologies and market applications and uses smart algorithms to quickly narrow down thousands of potential biomass-to-market pathways to the most feasible solutions.

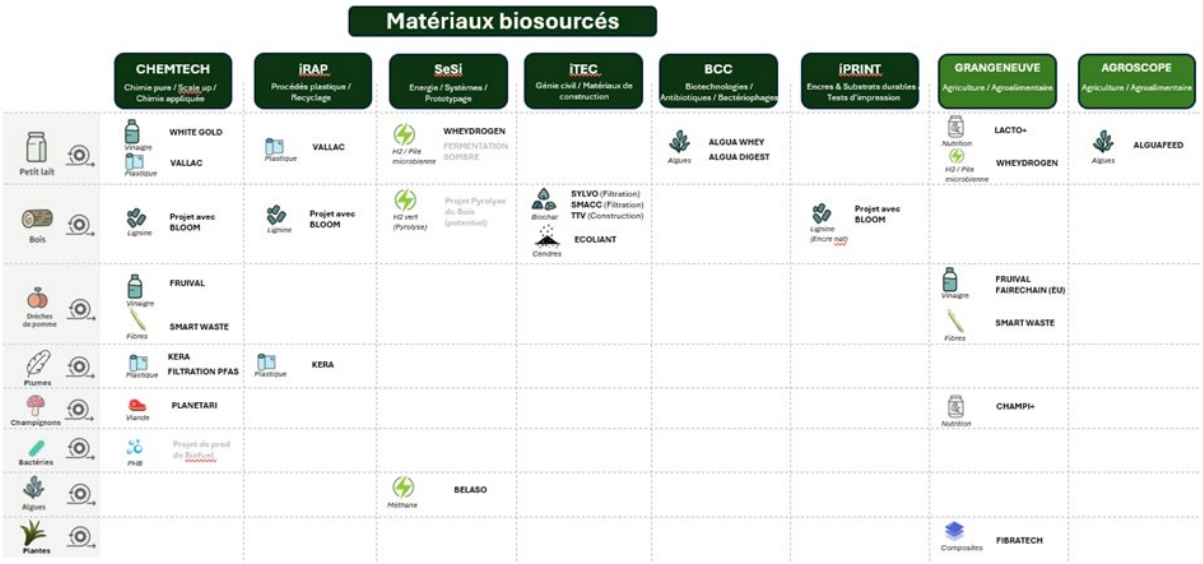
VCG.AI gathered, pre-processed, and integrated industry data to identify the priority biomass sources to orchestrate interesting circular value chains in the region.

- Whey, wood, apple pomace, chicken feathers, mushrooms, algae, fibrous plants

HEIA-FR then investigated its research and development capacities in the concerned fields and identified a series of ongoing research projects with the potential for valorization of the biomass sources in question. Figure 4 summarizes the results of the analysis. Valorization potential is currently being investigated in research projects including 6 out of 10 of HEIA-FR's research institutes. Covered valorization pathways include:

- Plastic materials, nutrition, lignin, biochar, biofuel, fibres, composite materials

Figure 4: Biomass valorization pathways in HEIA research projects



Source: HEIA-FR, internal analysis (2025).

Based on these interesting results, HEIA-FR decided to take two additional actions to capitalize on the identified opportunities:

- **Action II**: Implementing a series of workshops with companies and research institutes to connect partners in the most promising value chains and develop

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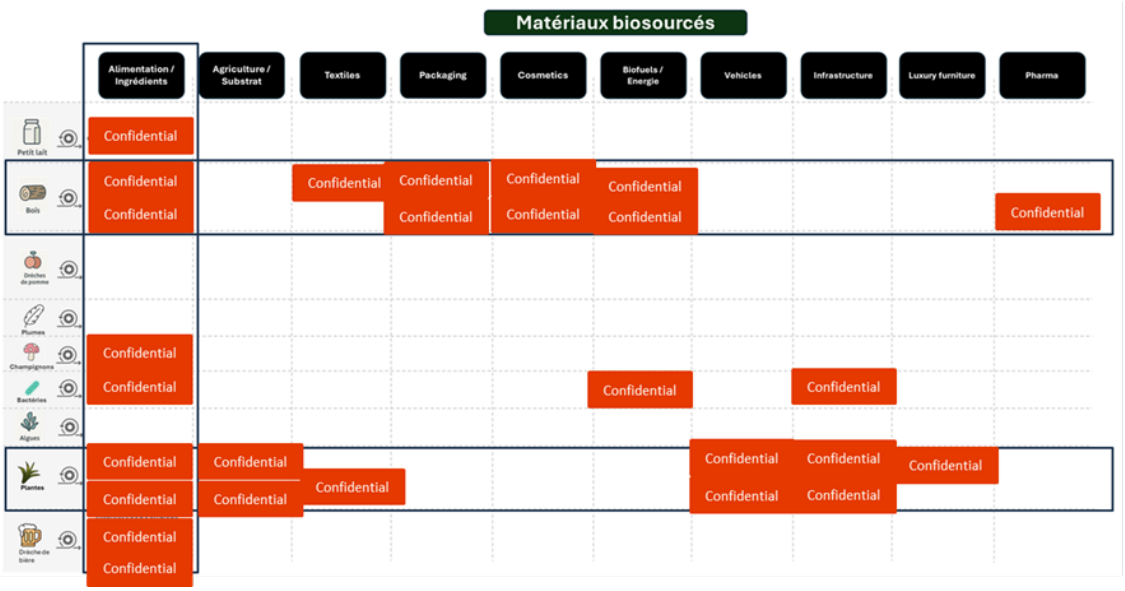
circular transition projects

- Status: it is planned to implement this action during the last period of the CRADLE-ALP project in cooperation with VCG.AI.
- The workshops will assess the valorization pathways for by-products by analyzing the alignment of solutions with circular bioeconomy principles according to value maximization, circularity and environmental impact, as well as by the following feasibility criteria:
  - Supply: Biomass availability in the region
  - Processing: Maturity of transformation technologies
  - Market: Market size of end-product and diversity of applications
- HEIA-FR is in touch with 15 interested companies (Figure 5 - confidential list available upon request).

Figure 5: Companies interested in the biomass valorization pathways



Source: HEIA-FR, internal analysis (2025).

- **Action III**: Developing a new Competence Center at HEIA-FR, supporting an R&D approach focused on the identified valorization pathways.
  - Status: ongoing, confidential work to be completed in 2026 in academic and political collaboration with the University of Fribourg, the HEG Fribourg (School of Management) and the canton of Fribourg.

6. Challenges & Achievements

Today, there is hardly any manufacturer that has not yet been confronted with the issue of circular economy in some form or another. Therefore, the topic of circular economy is well-known to SMEs and companies of the Alpine space being involved in the pilot actions of the Cradle-Alp project.

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This is due to the fact that EU and national regulations, upcoming restrictions and legislative initiatives, customer requirements, financial advantages but also strategic decisions of the management board, the need for more resilient supply chains, ideas for green business models or simply the willingness to contribute positively to industry and society are drivers that direct the companies towards circular economy approaches.

However, the definition and degree of understanding of circular economy varies strongly. For some SMEs it is more the aspect of sustainability, some think of replacement of fossil resources and for others it is the idea of closing the loop. For some SMEs it is about renewable energy while others start using side streams to build up completely new business models.

Accordingly, the status of commitment strongly differs. Where start-ups often begin from scratch with a green/circular/sustainable idea, established companies often realize their dependency within a value chain and the difficulty to replace existing production facilities to make their products more circular and sustainable.

Cradle to Cradle and sustainability certifications

There were large differences in companies' opinion regarding certificates and labels. In general, certificates and labels are regarded as useful by the majority of companies. However, it depends on the sector what kind of certificates are commonly used. And companies decide about the type of certificate depending on the necessary statement: less toxic, recyclable, bio-based etc. For example, in the packaging industry other labels/certificates are more common than in the textile or construction sector.

Therefore, it became obvious quite early during the project that a Cradle to Cradle certification is not regarded as equally significant in all five industry sectors addressed by Cradle-Alp. This does not mean that the overall idea of cradle to cradle approaches is seen as unimportant but the specific C2C certification was not considered equally important. For example, the Cradle to Cradle certification is well accepted in the construction industry, whereas the packaging sector uses different ones.
Some SMEs involved in Cradle-Alp stated that they looked into the Cradle to Cradle certification but decided not to use it due to high costs associated with the certification and lacking transparency in the process.
This is the main reason why the Cradle-Alp consortium agreed not to focus on Cradle to Cradle alone but to broaden the view on all kinds of circular economy approaches.

Achievements through Cradle-ALP pilot actions

In summary, the Cradle-ALP consortium partners were able to support **a total of 133 SMEs** with individual support offers, provided opportunities to present technological expertise and to connect with potential partners for building circular value chains and more sustainable business practices.

Project partner	Name of organization	# of SMEs assisted

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LP1	CCIAA Padova	20
PP2	TZ Horb	9
PP3	CCB	21
PP4	BOKU	-
PP5	Biz-Up	24
PP6	UniSMART	16
PP7	CCIS	14
PP8	Polymeris	24
PP9	HEIA-FR	5
Total		133

Table 1: This table shows how many SMEs were assisted/supported by the activities of the project partners during the pilot testing phase.

The interest in local and regional activities to gain knowledge in topics such as life cycle assessment, circular economy practises and best practices can be proved by the numbers of workshop participants. Overall representatives of **96 companies** participated in these regional collective Cradle-ALP offers.

In addition, almost **130 companies** participated in cross-border online and on-site match making events. This demonstrates that companies not only accept this type of activity, but also that it is an effective way of stimulating economic stakeholder exchange between more distant regions.

#	Match Making Event	Type	# registered/ participated	# bilateral meetings
1	Polymers/Composites, Chemistry	online	73 / 56	27
2	Packaging, plastics, recycling	onsite	97 / >40	49
3	Wood/Furniture	online	42 / >30	4
4	Packaging	online	18 / 19	5

Table 2: This table summarizes the participants that registered and finally participated in the transborder match making events and shows how many bilateral meetings were held between the participants.

Despite all challenges it can be said that the mix of individual services and collective actions reached those SMEs and start-up companies with a strong interest in and an open attitude for circular and bio-based businesses, sustainable practices and green transformation.

Those companies that actively participated not only had a strong interest in shaping a circular economy but appreciated the individual and collective support offers and the

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opportunity to feed in their point of view on challenges during the transformation process. This became clear already during the roadmap workshops and was further confirmed during the pilot actions.

As previously mentioned, many companies were initially sceptical about the individual support. However, following engagement with the workshops and piloting sessions, scepticism often transformed into strong interest and enthusiasm. It was even noted by some companies that they would have liked to involve more of their colleagues, which demonstrated the value of the tools during the practical sessions.

Regarding the initiation of business collaborations intended to replace fossil material with renewable products, direct and personal matching of companies with possible solution providers turned out to be most successful. In the case of Grüne Erde (Upper Austria) and Rottal Hanf (Bavaria) Cradle-ALP was successful to connect two regional partners across national borders resulting in exchange of materials to mutual personal site visits and finally an agreement for a future supply collaboration. The basis for this success was the deep understanding of the needs and expertise of the companies by the project partners in order to make the right suggestions. It is a tedious, lengthy process and needs to take many small steps. Therefore, it is necessary for business support organizations to be persistent and to keep track arranging meetings of company representatives in person and keep asking over and over again about the status quo of discussions and negotiations.

Pilot actions

During WP1 the Cradle-Alp consortium took much time to extensively discuss potential tools and services that may be useful to support SMEs and to create meaningful pilot actions. In the end the project partners agreed on several individual pilot action tools and some collective activities. These are summarized in chapter 3 of this deliverable.

The focus of the individual tools was set on an individual consulting service to advise SMEs on circular economy. The objective of collective actions was to use approaches to increase the knowledge transfer to SMEs and to actively connect solution providers and seekers to initiate circular processes.

When the project partners started to advertise the individual support services (pilot actions) everyone experienced in the first months that there was very little response from SMEs. This problem was discussed in the TSWG sector groups as well as in the periodical consortium meetings. There are numerous possible reasons: the benefits for SMEs were not clear, the communication channels chosen by each partner were not suitable/not well explained, the communication was confusing, too many similar offers from other organisations etc. In order to secure these individual consulting services, it was necessary to undertake a significant amount of labour, including contacting company representatives and outlining the advantages.

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Another reason might be that the range of the partner's networks was not large enough to reach and attract the right target group. Whereas the chambers of commerce have a large but heterogeneous network of companies that are partially not closely connected to the organizations, small cluster organisations may be able to reach their members easily but those may not have been attracted because they are already actively involved in circular economy approaches.
In general, one learning is that many companies seemed to be already engaged in circular approaches which explains why they did not feel attracted by the services offered.

In response to this situation, a number of ideas were discussed and finally agreed upon during the consortium meeting in Munich. These included extending the collective activities to reach more SMEs and offering a different support.

Therefore, the decision to offer additional collective actions, such as match making and workshops, alongside individual services, was a prudent one. In contrast, the workshops such as LCA and Lego Serious Play attracted larger numbers of companies and facilitated discussions on current issues in the circular economy. The match making events offered a platform to personally and directly connect with solution providers and putative R&D or business partners to initiate joint projects or novel value circles.

Challenges

All project partners faced challenges to motivate and recruit SMEs to participate in the individual pilot actions. While there was a general interest in the tools and services offered, the willingness to participate varied strongly.

It is clear that there is a certain level of interest in sustainable strategies and adjustments to circular concepts. However, established companies often treat this topic like a "nice-to-have" and currently due to economically challenging periods often do not want to invest time or resources.

Nevertheless, it proved challenging to convince companies to allocate time and resources to pilot the individual tools (SBMC, Circularity Compass, QuickScan). This difficulty can also be attributed to the complexity inherent in the nature and purpose of the tools utilised.

It was perceived that young companies/start-ups exhibited a greater degree of willingness to participate, however, their preference was to rather participate within a workshop setting than individually. Indeed, start-ups benefitted a lot from the individual service in discussing their business idea or generating new input to adjust it. Companies starting their engagement in circular economy benefitted more compared to those where circularity already comprises the core of their business model.

SMEs, where circular/renewable processes and products are part of their business model and companies, which have already been working with circular materials, rarely

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saw a benefit in the proposed tools. One reason for this could be that the instruments used often lacked the depth needed to produce substantial or actionable results. A good example is the Circularity Compass, which is effective at highlighting where improvements might be possible but falls short in offering concrete guidance on how to achieve those improvements - often the more complex question companies face.

The tools are perfect for companies at a very specific stage in their development. This is when a company is reflective enough to recognise the value of strategic tools, but not so advanced that the content feels too basic. This "sweet spot" was challenging to identify, and as a result, outreach efforts were not always successful.

The project partners primarily received interest in the services from those members of their network who had already expressed an interest in the subject of the circular economy. Generating interest among companies beyond the reach of the networks and identifying SMEs unfamiliar with the concept of the circular economy proved to be a big challenge. This explains for example the inability of the TSWG on textiles to engage a larger number of textile enterprises, despite the significance of the subject matter within this industry.

A major challenge was the goal of intensifying cross-border exchange and networking in order to initiate several transregional value chains. Reasons for the low level of success include differences in corporate culture, low familiarity with the tools offered and even communication difficulties. In addition, the project partners faced the difficulty of working across all five industry sectors. Although not all five sectors are necessarily inter-connected, certain overlaps exist. This raised the question among partners how to stimulate the exchange without working on the same topics and with the same SMEs in all sector groups. A lesson learnt is that a stronger focus on only one or two sectors might be more efficient to strengthen knowledge transfer, innovation and R&D collaborations.

Another key insight is that all project partners benefit more if there is a common agreement of well elaborated tools to be used for the pilot actions. A difficulty was to ensure sufficient training and understanding of the tools among project partners, which occasionally limited the quality and consistency of implementation. In the end, most project partners only used those individual support tools that are well-known and familiar to them and/or where they felt safe enough to start coaching a SME.

Support Tool/Activity	Suggested by	Tested/applied by project partner
SBMC	PP2	PP2, PP5, PP7
QuickScan	LP1	LP1, PP3, PP5, PP6
Circularity Compass	PP7	PP2, PP5, PP7, PP8
LCA/LSP workshop	PP5	PP3, PP5, PP7, PP8

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VCG	PP9/PP3	PP9
Match Making	PP3	LP1, PP2, PP3, PP4, PP5, PP7, PP8
Direct Matching/Visit	PP3	PP2, PP3, PP5, PP8
Joint booth	PP5	LP1, PP2, PP3, PP4, PP5, PP7

Table 3: This tables provides an overview which tools were applied by the different project partners

Overall, the piloting activities were beneficial for the majority of companies, particularly by offering new perspectives on circular business models, environmental reporting, and the potential for enhanced sustainability performance. These tools have enabled companies to identify practical steps towards more circular operations, and the discussions have provided an opportunity for reflection on both the environmental and strategic dimensions of their work.

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