Interreg CENTRAL EUROPE

Co-funded by the European Union

CURIOST

Circular design and development of sustainable products in 4 key sectors in Central Europe

Version 1

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CAPITALIZATION OF BEST PRACTICES AND BENCHMARK IN SUSTAINABLE PRODUCT DESIGN IN CENTRAL EUROPE

RESULT D 1.1.3

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1. INTRODUCTION

This report for D 1.1.3 for the CURIOST project summarizes Best Practice Cases on sustainable and circular product design in the different countries.
In a second step they we classified for comparability. We found 8 types of best practices.

2. BEST PRACTICE COLLECTION

The following procedure was used for this purpose:
Eyer partner and country submitted Best Practice examples. They were collected in a table with the following data:

Partner	Title of the practice	Name of the organization	City, Country	Type of organization	Type of practice	Sectors	Thematic relevance	Short description

In the second step, the submitted examples were analyzed according to their short description of whether there are comparable Best Practices in other countries. If yes they were marked by the same category. With this comparison, we found 8 categories of Best Practices.
These examples together with the results of the analysis of deliverables D 1.1.1 and D 1.1.2 form the basis to evaluate appropriate business models, that are suitable for sustainable and circular product design.

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3. COLLECTION AND CATEGORIZATION OF BEST PRACTICE EXAMPLES

The individual best-practice examples were summarized in the Categories column (yellow) using correlations. No similarities with other best practices were found in category 0.

	Partner	Title of the practice	Name of the organization	City, Country	Type of organization	Type of practice	Sectors	Thematic relevance	Category	Short description
1	1-BIZ-UP(AT)	2nd life machine market	ENGEL AG	Schwertberg, Austria	Manufacture	Technology	Mechanic & Mechatronics technician	Product design	**1**	By buying back and overhauling used machines and adapting them to customer requirements, ENGEL is opening up new areas of business and offering cost-effective, individually modifiable solutions.
2	1-BIZ-UP(AT)	Market for second-life machines	WFL Millturn GmbH	Linz, Austria	Manufacturing	Technology	Mechanic & Mechatronics technician	Product design	**1**	WFL strengthens its market position through the development of retrofitting and the buyback and overhaul of used machines by offering attractively priced, standard-compliant used machines and at the same time convincing customers with discounts on new purchases or cost-effective alternatives.
3	2-CPU(AT)	Production and printing of packaging and films	Coreth	Unterwaltersdorf, Austria	SMES		Plastics, packaging	Product design, recycling process, circular business models, reintegration of recycled materials	**4**	CORETH offers a wide range of recyclable film products, operates according to the principles of the circular economy and has strengthened its commitment to sustainable and customized solutions by expanding its production and recycling capacities and introducing high-quality printed films.
4	2-CPU(AT)	Recycling and recovery of packaging	ARA	Vienna, Austria	NPO	The business model	Product design, recycling process, processing of materials, circular business models, packaging		**4**	ARA supports companies and consumers with comprehensive services to implement the circular economy, including recycling management, packaging optimization and the provision of high-quality secondary raw materials, and meets EU requirements for environmentally friendly packaging design, supplemented by specialized subsidiaries for various waste and recycling areas.
5	2-CPU(AT)	Design and construction	BAUMIT	Waldegg, Austria	International manufacturing company		Building industry	Processing of materials, circular business models	**3**	Baumit is committed to sustainable building material production with ambitious targets such as a 20% CO2 reduction by 2030, energy-efficient innovations such as 3D printing technologies and the promotion of circular economy, while driving sustainable, healthy and aesthetic construction through high-quality products and research.
6	2-CPU(AT)	Machines for special purposes	IAG GmbH	Weikersdorf am Steinfelde, Austria	SMES	The business model	Mechanic & Mechatronics technician	Product design, circular business models	**2**	IAG develops customized, automated systems that impress customers worldwide with their long-lasting quality, comprehensive service and individual advice.

7	3-UEBA(SK)	Sustainable product solution for mobil online	mobil online.sk Ltd	Lučenec, Slovakia	Ltd.	The business model	Plastics, packaging	Processing of materials, circular business models	**0**	Mobilonline.sk focuses on sustainability through the purchase and resale of used devices, innovative recycling initiatives such as the first eco-shop and reusable packaging to make products more environmentally friendly and socially accessible.
8	3-UEBA(SK)	Sustainable recycled products at sobi.eco	Sobi o.z.	Bratislava, Slovakia	Citizens' association	Support from politics and business	Plastics, packaging	Decentralized business models	**4**	sobi.eco combines sustainable production from recycled materials with social commitment by creating jobs for disadvantaged groups and producing environmentally friendly, minimalistically designed products that reduce waste and promote awareness of the circular economy and responsible consumption.
9	3-UEBA(SK)	Ecodesign - waste prevention - reuse - closing material flows	Corplex Slovensko, s.r.o.	Hurbanovo, Slovakia	Ltd.	Technology	Plastics, packaging	Recycling process, circular business models, reintegration of recycled materials	**4**	Corplex offers recycling solutions, collects and processes plastic waste into high-quality recycled materials and thus supports companies in implementing closed loops and reducing CO_2 emissions in line with the principles of the circular economy.
10	3-UEBA(SK)	Honest apartments and business premises in Bratislava - YIT Slovakia, a.s.	YIT Slovakia, a.s.	Bratislava, Slovakia	INC	Support from politics and business	Building industry	Processing of materials, circular business models	**3**	YIT designs sustainable and liveable urban districts, revitalizes historic buildings and integrates innovative technologies such as geothermal energy and green roofs to reduce CO_2 emissions and promote environmental and social responsibility in the construction sector.
11	4-PBKIK(HU)	Sustainable cement solutions at Holcim Ltd.	Holcim Hungary Ltd.	Pécs, Hungary	Ltd.	Support from politics and business	Building industry	Recycling process, processing of materials, circular business models	**3**	Holcim is committed to sustainable building practices, promotes awareness of carbon neutrality through environmental education programs and participates in innovative cement production using alternative fuels and raw materials to reduce CO_2 emissions and actively engage society in change.
12	4-PBKIK(HU)	Sustainable and circular building practices at IMG Építő Ltd.	IMG Építő Ltd.	Pécs, Hungary	Private company	The business model	Building industry	Product design, processing of materials, reintegration of recycled materials	**0**	IMG Építő Ltd. is a Hungarian construction company that implements sustainable practices in residential and industrial construction projects, including selective waste collection, the use of renewable energy and the use of environmentally friendly building materials to minimize waste and increase efficiency.
13	5-SPC(PL)	Production of plastic mixtures	Cavitel Sp. z o.o.	Trzciana, Poland	Entrepreneurship, SMEs	Technology	Plastics	Product design, recycling process, processing of materials, circular business models, reintegration of recycled materials	**4**	Cavitel SP. z o.o. is a company specializing in the production of plastic compounds, in particular LDPE-based calcium carbonate fillers. The company is actively committed to protecting the oceans by recycling plastic waste, including fishing nets, and producing innovative, sustainable products such as the environmentally friendly calcium carbonate filler CG 75K.
14	5-SPC(PL)	Plastic packaging solutions - recycled plastic	Plast-Box S.A.	Słupsk, Poland	Companies, except SMEs	Technology	Packaging	Material sourcing, product design, recycling process, processing of materials, circular business models, reintegration of recycled materials	**4**	Plastbox is a manufacturer of sustainable plastic packaging solutions that are produced according to the principles of the circular economy. The company uses recycled materials such as Post-Consumer Recycled (PCR) and Post-Industrial Recycled (PIR) plastic to produce packaging that is both environmentally friendly and efficient. By recycling plastic waste, Plastbox reduces the need for primary raw materials, reduces landfill volumes and lowers greenhouse gas emissions.

15	5-SPC(PL)	Packaging manufacturers - ecological solutions	Polpak Sp. z o.o.	Warszawa, Poland	Companies, except SMEs	Technology	Packaging	Material sourcing, product design, recycling process, processing of materials, circular business models, reintegration of recycled materials	**4**	Polpak is a Polish packaging manufacturer. The company offers a wide range of environmentally friendly packaging, including packaging made from recycled materials, biodegradable films and films made from renewable energy sources. Polpak focuses on reusable and recyclable packaging that optimizes material consumption and reduces waste through minimalist design. The company is also committed to extended producer responsibility (EPR) and ensures that its packaging is properly recycled.
16	6-STEP RI(HR)	DRACO Pro - initiatives for the circular economy in waterproofing solutions	DRACO Grupa	Solin, Croatia	SMES	Technology, The business model	Building industry	Procurement of materials, processing of materials	**5**	DRACO Grupa is a company specializing in the development and manufacture of waterproofing products for the construction industry. The company implements the principles of the circular economy by using waste materials and renewable energy to minimize its environmental impact. DRACO is in the pilot phase of scaling its initiatives, utilizing waste products from other industries to formulate its products and has introduced water-based waterproofing materials to reduce CO2 emissions and volatile organic compounds.
17	6-STEP RI(HR)	Ecolant - Biodegradable and compostable lantern innovation	Primax d.o.o.	Slavonski Brod, Croatia	SMES	Technology, The business model	Plastics	Material procurement, product design, recycling process, processing of materials	**4**	Primax d.o.o. is a Croatian company specializing in the production of plastic products, in particular bin liners, freezer bags and cemetery lanterns. The focus is on sustainability and the use of recycled materials, with over 90% of plastic film production coming from recycled raw materials. The lanterns are made from flame-retardant paper and the packaging is made from 100% recycled PVC. Primax pursues an energy-efficient production process in which all production waste is recycled, thus contributing to the circular economy.
18	6-STEP RI(HR)	Sustainable asphalt production with recycled materials	University of Rijeka Faculty of Civil Engineering	Rijeka, Croatia	Higher education and research institutions	Technology, The business model	Building industry	Material procurement, product design, processing of materials	**5**	Faculty of Civil Engineering at the University of Rijeka focuses on the development of sustainable construction materials, in particular recycled asphalt mixtures, to reduce the need for virgin materials in construction and minimize the environmental impact of waste materials. Research includes the integration of recycled rubber and plastic into asphalt mixtures for road construction, which both conserves natural resources and improves waste management by reducing landfill waste.
19	6-STEP RI(HR)	Lož-Metalpres - Circular economy and recycling in the production of plastic and metal components	Lož-Metalpres	Plešce, Croatia	SMES	Technology, The business model	Plastics	Material procurement, recycling process, processing of materials	**4**	Lož-Metalpres specializes in the production of plastic and metal components, in particular bathroom siphons. The company integrates circular economy principles by returning production residues such as plastic and metal waste to the manufacturing process.

20	7-MJC(HR)	Sustainable mechanics and mechatronics	Ferro price	Čakovec, Croatia	SME - medium	Technology, The business model	Mechanic & Mechatronics technician	Material procurement, product design, recycling process, collection/sorting of plastic waste, reintegration of recycled plastics	**2**	Ferro-Preis d.o.o. produces high-quality cast products, machine parts and industrial equipment, using innovative technologies to increase efficiency. It promotes sustainability through the use of secondary metals, recycling and an energy management system in accordance with ISO 50001. Ferro-Preis relies on continuous employee training that promotes both a safe working environment and a culture of sustainable practices.
21	7-MJC(HR)	Sustainable building	KNAUF	Novi Marof, Croatia	SMES	Technology, The business model	Building industry	Material procurement, product design, recycling process, processing of materials	**6**	Knauf Insulation aims to reduce embodied carbon, landfill waste and fresh water consumption, while increasing recycling and energy efficiency. The company is committed to sustainable packaging. The company relies on partnerships with suppliers, waste management companies and policy makers to drive the circular economy and improve its sustainable practices.
22	7-MJC(HR)	Sustainable packaging/plastics	MURAPLAST d.o.o.	Kotoriba, Croatia	SME - medium	Technology, The business model	Plastics/plastics	Product design, recycling process, processing of materials, collection/sorting of plastic waste, reintegration of recycled plastics	**3**	Muraplast d.o.o. integrates sustainable practices along the entire value chain. The company is committed to the circular economy, minimizing environmental impact and maximizing resource efficiency. This includes reducing greenhouse gas emissions, increasing the proportion of recycled content and using recyclable materials. Muraplast is committed to sustainability through the "muraeco" eco-label, joining global supply chain initiatives such as SEDEX and EcoVadis and working closely with suppliers to ensure high sustainability standards.
23	8-MESAP (IT)	Sustainable tire recycling and circular design	European Tire Recycling Association (ETRA)	Brussels, Belgium	Interest groups including NGOs	Technology	Plastics	Product design, recycling process, processing of materials, circular business models, reintegration of recycled materials	**4**	ETRA (European Tyre Recycling Association) is committed to sustainable practices in tire recycling by promoting the use of recycled tire products and supporting the principles of circular design. The organization works closely with tire manufacturers to develop products that are recycling-friendly and uses digital tools to optimize recycling processes and promote transparency. ETRA also plays an active role in research and innovation in the field of high-quality recycled materials and supports EU projects such as LIFE and Horizon Europe.
24	8-MESAP (IT)	BEFAIR project: Sustainable production by measuring the carbon footprint in real time (with financial support from the European Commission via the	LAMEBO	Torino, Italy	SMES	Technology	Mechanic & Mechatronics technician	Processing of materials	**0**	The BEFAIR project aims to improve sustainability and operational efficiency at Lamebo by integrating innovative IoT technologies such as the OverGreen platform for real-time monitoring of energy consumption and carbon footprint, with the methods developed being transferable to other resource-intensive sectors.

		GreenSME project)								
25	9-ENVIPARK (IT)	ALKIVIO	ALKIVIO	Italy	Start-up	Technology, The business model	Plastic	Recycling process, processing of materials, circular business models, reintegration of recycled materials	**0**	The Alkivio® project develops biocomposites from paper waste that offer a sustainable, compostable alternative to plastics and offers prototyping and consultancy to companies to develop more sustainable production processes, with solutions that are scalable and customizable.
26	9-ENVIPARK (IT)	RECYCLING OF SPORTS EQUIPMENT	RE-SPORT	Italy	Start-up	Technology, The business model	Plastic	Recycling process, processing of materials	**0**	RE-SPORT develops innovative recycling technologies for complex materials from the sports industry to recycle sports equipment and everyday items made of plastics and composites, and works with sports equipment manufacturers to optimize the recycling process from proof of concept to industrial scale-up.
27	9-ENVIPARK (IT)	Sustainable building	KNAUF	Novi Marof, Croatia	SMES	Technology, The business model	Building industry	Material procurement, product design, recycling process, processing of materials	**6**	Knauf Insulation is committed to reducing carbon, waste and water consumption, increasing recycled content and improving energy efficiency, and working with various stakeholders to develop sustainable, energy-efficient insulation solutions for the construction industry.
28	10-UCB	Lorenz: Pioneer for smart metering and the circular economy	Lorenz GmbH & Co KG	Schelklingen, Germany	The company	Technology, The business model	Mechanic & Mechatronics technician	Product design, circular business models	**0**	Lorenz GmbH & Co KG is a leading manufacturer of water meters and communication technologies that minimizes its environmental footprint through sustainable, resource-conserving practices such as the use of copper and intelligent recycling methods, while producing high-quality, durable products that meet the competitive advantages of Made in Germany.
29	10-UCB	The first approved underfloor heating pipe on the market that contains regranulate	MAINCOR Rohrsysteme GmbH & Co KG	Schweinfurt, Germany	The company	Technology	Plastics, construction	Product design, reintegration of recycled materials	**3**	MAINCOR Rohrsysteme GmbH & Co KG focuses on sustainability by generating its own electricity via photovoltaics and using recycled plastic in pipe production in order to reduce its CO2 footprint and drive forward resource-saving innovations.
30	10-UCB	Sustainable window solutions from REHAU	REHAU	Erlangen, Germany	The company	Technology	Plastics, construction	Product design, recycling process, reintegration of recycled materials	**0**	REHAU promotes sustainable window solutions through the use of recycled plastic and innovative recycling technologies that strengthen the circular economy and at the same time improve the conservation of resources and energy efficiency of the products.
31	10-UCB	A NEW GENERATION OF MATERIALS	without a trace	Hamburg, Germany	Start-up	Technology	Plastics	Material procurement, recycling process, processing of materials	**0**	traceless materials GmbH is developing a biodegradable alternative to conventional plastics made from natural agricultural by-products that is fully compostable and offers an environmentally friendly solution for packaging and other applications.

32	11-BI	Sustainable, barrier-free senior apartments with services	RAAB Baugesellschaft mbH & Co KG	Ebensfeld, Germany	SMES	Business model	General, Construction	Product design	**0**	All apartments will be barrier-free and offer bright, attractive living spaces. To ensure that the interiors are illuminated with plenty of natural light, almost all kitchens and bathrooms will also have windows. The spacious bathrooms are equipped with level-access showers.
33	11-BI	Sustainability and recycling with sand-lime brick	Zapf GmbH & Co KG	Hof, Germany	SMES	Technology, business model	Building industry	Material procurement, recycling process, processing of materials, circular business models, reintegration of recycled materials	**7**	Sand-lime bricks consist of 3 natural raw materials: lime, sand and water - nothing else. They are mined in local quarries with only very short transportation routes. Very little energy is required for production. The stone is hardened exclusively with steam at 200 degrees Celsius. All residual materials generated during production are crushed using crushing plants and fed directly back into the production process. This means that there is no production of waste.
34	11-BI	Circular building with clinker brick	Girnghuber GmbH	Marklkofen, Germany	SMES	Technology, business model	Building industry	Material procurement, recycling process, processing of materials, circular business models, reintegration of recycled materials	**7**	GIMA clinker bricks for façades and floors can currently be produced with a recycled content of up to 40 percent. GIMA makes a contribution to circular construction with its recycled clinker, which can consist of broken clinker bricks, surplus clinker bricks or clinker bricks that have been dismantled by type. Secondary raw materials from external companies can also be processed.
35	11-BI	Circular product design throughout the wall structure	Hagemeister, drystack, Concular and TRIQBRIQ	Germany, Netherlands	SMES	Technology, business model	Building industry	Material procurement, recycling process, processing of materials, circular business models, reintegration of recycled materials	**7**	The "circulation wall" is a fully-fledged, load-bearing exterior wall. All the elements used are joined together without glue or mortar and can therefore be dismantled separately and without damage. The entire wall can be erected quickly, easily and cleanly. TRIQBRIQ produces the load-bearing solid wood wall. The wood used for this comes from

4. SUMMARY

We have collected and analyzed 35 Best Practice Cases for circular economy projects in all partner countries. These will be further used for the evaluation of business cases in A1.2.
In a first step, we have evaluated these 35 examples towards similarities. We found 8 categories:

0. Stand-alone best practice examples

1. **Buyback and Refurbishment / Remanufacturing of Machines**
   Topic: Used machines are bought back, refurbished, and adapted to customer requirements.
   Goals:
   - Expanding the business model with cost-effective, customizable solutions.
   - Strengthening customer loyalty with attractive alternatives such as discounts on new machines.
   - Promoting sustainability through the reuse of machinery.

2: **Durable, Customized Systems**
   Topic: Development of durable, customized, and automated systems.
   Goals:
   - Sustainable production through quality and efficiency.
   - Tailoring products to specific customer needs with comprehensive service.

3: **Sustainable Construction and CO_2 Reduction**
   Topic: Advancing sustainable construction practices, CO_2 reduction, and circular economy in the building sector.
   Goals:
   - Use of innovative technologies such as 3D printing, geothermal energy, and green roofs.
   - Conservation of resources through recycled materials and energy-efficient production.
   - Raising awareness of sustainable construction and promoting aesthetic, healthy designs.

4: **Circular Economy in Plastics and Packaging**
   Topic: Promoting circular economy through recycling, innovative materials, and sustainable production.
   Goals:
   - Producing products from recycled or recyclable materials.
   - Optimizing packaging and minimizing waste.
   - Supporting social responsibility and environmental awareness.

5: **Sustainable Waterproofing and Construction Products**
   Topic: Utilizing waste materials and renewable energy to produce waterproofing products.
   Goals:
   - Reducing CO_2 emissions and volatile organic compounds.
   - Integrating waste materials from other industries into production.
   - Developing water-based products to lower environmental impact.

6: **Energy-Efficient Insulation and Recycling in Construction**
   Topic: Development of sustainable insulation materials and improved recycling processes.
   Goals:
   - Reducing carbon and water consumption.
   - Increasing recycled content and promoting energy efficiency.
   - Collaborating with partners to enhance circular economy practices.

7: **Sustainable Building Products and Circular Design**
   Topic: Production of sustainable building materials such as sand-lime bricks and recycled clinker with a high recycling content.
   Goals:
   - Conserving resources through reuse and local material sourcing.
   - Creating dismantlable and reusable constructions.
   - Minimizing energy consumption and waste in production.