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CURIOST

METHODOLOGY KIT

FOR THE DEVELOPMENT OF AN ECONOMICALLY SUCCESSFUL CIRCULAR PRODUCT



DELIVERABLE 2.4.2

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METHODOLOGY KIT
FOR CIRCULAR PRODUCT DEVELOPMENT
FROM BUSINESS CASE TO SUSTAINABLE BUSINESS MODEL

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PURPOSE
Enable manufacturing companies to develop economically viable circular MVPs by integrating economic and environmental value.

TARGET GROUP
Manufacturing SMEs and small midcaps in:
- Mechanics & mechatronics
- Plastics
- Packaging
- Construction

OUR APPROACH
A two-stage methodology in six phases that combines analysis, co-creation, real-life testing and feedback loops with innovation experts. Practical, iterative and results-driven.



7 regions



29 companies

Tested across sectors and real companies in Central Europe.

STAGE 1 – SUSTAINABLE BUSINESS CASE DEVELOPMENT

"What is the problem and how can we find a first solution to solve it?"

1 PREPARATION
- Align expectations and objectives
- Define roles, responsibilities and resources
- Ensure management commitment

2 ASSESSMENT
- Analyse current business model and value chain
- Identify economic and environmental impacts and gaps
- Map opportunities for circular solutions

3 CO-CREATION
- Co-create ideas and solutions with internal teams and stakeholders
- Explore circular strategies and value propositions
- Prioritise promising options

STAGE 2 – PILOTING AND ADAPTATION OF THE BUSINESS MODEL

"How does the sustainable business case support the transition to a more sustainable business model?"

4 DEVELOPMENT
- Develop sustainable business cases
- Evaluate feasibility, value and risks
- Select the most promising solution(s)

5 PILOTING
- Test the solution in real-life conditions
- Collect data, measure impact and feedback
- Validate assumptions and performance

6 ADAPTATION
- Refine solution and business model
- Integrate into operations
- Scale and plan for replication

KEY SUCCESS FACTORS – ACROSS ALL PHASES

COLLABORATION
Continuous interaction between companies, facilitators and regional stakeholders enhances learning and innovation.

FLEXIBILITY
The methodology adapts to different sectors, company sizes and regional contexts.

FEEDBACK LOOPS
Feedback between phases supports continuous improvement.

PRACTICAL FOCUS
Real-world application, piloting and testing ensure relevance and measurable impact.

OUTPUT & IMPACT

VALIDATED CIRCULAR MVP
Tested in real conditions and strengthened.

→

ADAPTED & SCALABLE BUSINESS MODEL
Refined, de-risked and ready to scale.

→

SUSTAINABLE GROWTH & COMPETITIVE ADVANTAGE
Driving circular transition and long-term value.



Creating value for business, people and the planet.

A practical, iterative and collaborative methodology to turn sustainability challenges into business opportunities – **from understanding the problem to piloting the solution towards a more circular economy.**



CURIOST OVERVIEW: CIRCULAR DESIGN AND DEVELOPMENT OF SUSTAINABLE PRODUCTS IN CENTRAL EUROPE

Project overview

The ongoing transition to a circular economy is not only a tedious obligation for the manufacturing industry. It also offers an opportunity to develop innovative sustainable products. The **CURIOST** project helps small- and medium-sized companies in sectors like **mechanics, packaging, plastics, and construction** to harvest the potential benefits, helping selected companies to develop tailor-made, innovative, sustainable and circular solutions.

Objectives

By focusing on these objectives, CURIOST aims to drive the **green transition in Central Europe's manufacturing industry**, promoting environmental sustainability while unlocking new business opportunities for SMEs:

- **Enable sustainable product development**: assist SMEs and small mid-caps in developing innovative, sustainable products by adopting circular economy principles
- **Foster transnational collaboration**: encourage cooperation among 11 partners from seven Central European countries to share expertise in product development, business innovation, circular economy, and environmental topics
- **Develop strategic frameworks**: create comprehensive strategies and action plans to support the uptake of sustainable product development solutions by SMEs and small mid-caps in the targeted sectors.



CURIOST in numbers

FOCUS ON THE METHODOLOGY: A KIT FOR MANUFACTURING COMPANIES

The **Methodology Kit for the development of an economically successful, circular product** provides a two-stage approach that guides manufacturing companies from defining a sustainable business case to piloting and adapting the business model.

How It Worked

The methodology was tested across **7 regions** in Central Europe with **29 SMEs and small midcaps** from the mechanics & mechatronics, plastics, packaging, and construction sectors.

The methodology emphasizes **co-creation and practical testing** as essential elements for developing and refining **sustainable and circular MVPs**, which can subsequently support the transition towards **more sustainable business models.**

Purpose

This methodology enables manufacturing companies to a systematic two-stage guidance to develop an economically successful, circular MVP, considering **economic and environmental dimensions at the same time.**

It provides a structured yet flexible process that guides from initial preparation and assessment to **the scaling of a sustainable business case into sustainable business models.**

The **target group** for this methodology kit are the manufacturing companies.

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interreg-central.eu/projects/curiost/.eu

FROM CONCEPT TO IMPACT: AN ITERATIVE PATH TO SUSTAINABLE BUSINESS MODEL INNOVATION

TWO-STAGE APPROACH

The methodology is structured as a **two-stage approach** within a total of **six phases** that supports companies in systematically **developing, testing, and refining sustainable products.** The process typically runs over several months and requires active involvement from both companies and experts.

It combines **analytical work, collaborative workshops, real-life experimentation (piloting) and recurring feedback loops** with innovation experts ("Creative Heads"), ensuring both theoretical grounding and practical applicability.

The process is designed to be **iterative** rather than strictly linear. This allows companies to continuously refine their solutions based on real-world insights and expertise.

The two stages guide companies in developing circular and economically successful MVPs and support their transition towards more sustainable business models.

Together, they form the basis of the methodology kit:

STAGE 1 - SUSTAINABLE BUSINESS CASE DEVELOPMENT

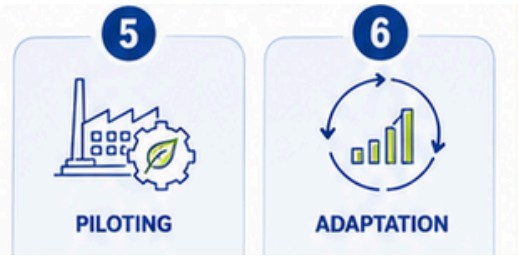
"WHAT IS THE PROBLEM AND HOW CAN WE FIND A FIRST SOLUTION TO SOLVE IT?"



- Creates economic, environmental, and social value
- Integrates sustainability into business activities
- Is practical and implementable within company operations

STAGE 2 - PILOTING AND ADAPTATION OF THE BUSINESS MODEL

"HOW DOES THE SUSTAINABLE BUSINESS CASE SUPPORTS THE TRANSITION TO A MORE SUSTAINABLE BUSINESS MODEL?"



- Considers benefits, risks, and impacts
- Is validated and strengthened through testing (piloting)
- Supports business model adaptation

ACROSS ALL PHASES, FOUR ELEMENTS CONTRIBUTE TO THE SUCCESS OF THE METHODOLOGY KIT:

- **Collaboration**: continuous interaction between companies, facilitators, and regional stakeholders enhances learning and innovation.
- **Flexibility:** The methodology can be adapted to different sectors, company sizes, and regional contexts.
- **Feedback loops:** Feedback loops between phases support continuous improvement.
- **Practical focus:** Emphasis on real-world application ensures relevance and impact.

These elements ensure that the methodology is not only structured but also responsive to real-world challenges and opportunities.

STAGE 1: SUSTAINABLE BUSINESS CASE DEVELOPMENT (PHASES 1-4)

The first four phases of the methodology kit focus on the development of the sustainable business case, addressing the key questions: **“What is the problem and how can we find a first solution to solve it?”**

During these **four phases**, companies, together with Creative Heads, analyse their **current situation, explore opportunities, and co-create innovative ideas.** These ideas are then transformed into **structured and actionable sustainable business model cases.**

The developed business cases provide the foundation for **piloting and business model adaptation in the subsequent phases.**



1 PREPARATION

The **preparation phase** establishes the foundation for the entire process. It focuses on ensuring that a **company's expectations are aligned and resources are secured.**

A company's interest in sustainability, openness for innovation and willingness to actively participate in workshops and testing activities are crucial.
Also, a clear definition of individual objectives is essential at this stage. This includes **identifying the company's motivation, expected outcomes, and potential constraints.**

In addition, roles and responsibilities among a company's participants are clarified. Company representatives and guiding experts need to define how they will collaborate throughout the process.

In manufacturing, preparation requires **strong internal alignment across departments**, which is more complex than in service sectors. Preparation must account for **technical feasibility and operational continuity,** not just strategic intent:

- Involvement of production, procurement, R&D, and sustainability teams
- Consideration of existing production systems and constraints (e.g. machinery, supply chains)
- Early identification of resource-intensive processes (energy, raw materials)
- Need for management commitment, as changes often require investment and operational adjustments



KEY OUTCOME:

A shared understanding of the methodology and commitment from all involved stakeholders



TOOLBOX:

The tools and templates supporting this phase are provided in the 🔗 **Methodology kit Annex - Practical tools and templates** under the section **Business case input form**

2 ASSESSMENT

The **assessment phase** focuses on analysing the **current state of the company's business model and identifying areas for improvement from a sustainability perspective**:

- Companies **examine key components** such as value proposition, customer segments, revenue streams, cost structures, and resource use.

At the same time, **environmental and social impacts are assessed** to identify risks and opportunities.

This phase typically includes structured workshops using analytical tools, such as Sustainable business model, Value HIll Model and other Design thinking methods that help companies better understand:

- their current positioning
- sustainability challenges
- potential leverage points for innovation

An important aspect of this phase is **stakeholder reflection,** where companies consider expectations from customers, regulators, and society.

For manufacturing companies, assessment goes deeper into physical processes and resource flows:

- Analysis of material flows, energy use, and production efficiency
- Identification of waste streams and circularity potential
- Assessment of supply chain dependencies and risks
- Consideration of regulatory requirements (e.g. emissions, standards)



KEY OUTCOME:

A clear assessment of the existing business model and a prioritised list of sustainability challenges and opportunities, which serves as input for the next phase.



TOOLBOX:

The tools and templates supporting this phase are provided in the 🔗 **Methodology kit Annex - Practical tools and templates** under the section **Design Thinking methods and business canvas**

3 CO-CREATION

The co-creation phase is highly interactive and focuses on generating innovative ideas for sustainable business cases:

- Companies participate in facilitated workshops together with stakeholders such as regional actors, experts, and, where relevant, other companies. This collaborative environment encourages the exchange of perspectives and the exploration of new approaches.

Creative methods are used to stimulate ideation including e.g. brainstorming, scenario building, and design-thinking approaches. During this phase, companies are encouraged to think beyond incremental improvements and explore transformative ideas, such as new value chains, or service-based models.

In manufacturing, co-creation must bridge technical expertise and business innovation. Ideas must be both innovative and technically feasible within production systems:

- Inclusion of engineers and technical experts, not only management
- Exploration of circular production models, product redesign, servitisation (e.g. product-as-a-service) together with experts ('Creative Heads')
- Strong role of external partners (suppliers, technology providers)



KEY OUTCOME:

A portfolio of potential business cases / MVP ideas, which are then further refined and evaluated in the next phase.



TOOLBOX:

The tools and templates supporting this phase are provided in the 🔗 **Methodology kit Annex - Practical tools and templates** under the section **Design Thinking methods and business canvas**

4 DEVELOPMENT

In the **development phase**, **selected ideas from the co-creation stage are transformed into concrete business case concepts**. Companies **evaluate** technical requirements, market potential, and organisational implications to ensure these concepts are both innovative and implementable.

At this stage, **feasibility is evaluated** by further developing and refining key elements of the business case, including:

- value propositions,
- target customer groups,
- key activities and resources,
- strategic partnerships, and
- financial structures and revenue models.

Facilitation support is particularly important here, as companies often need guidance in structuring their ideas and translating them into coherent business cases.

In manufacturing, **development requires detailed technical and economic validation**. Concepts must be translated into viable production solutions, not just conceptual models:

- **Integration of production** requirements into business models
- Assessment of **machinery adaptation needs, investment costs, impacts on production efficiency**
- Alignment with **existing supply chains and logistics**



KEY OUTCOME:

Well-defined business model cases that are ready for testing through piloting.

STAGE 2: PILOTING AND ADAPTATION OF THE BUSINESS MODEL (PHASES 5-6)

The phases 5 and 6 of the methodology kit focus on implementing the business case and transitioning from a business case to a more sustainable business model, addressing the key question: **„How does the sustainable business case support the transition to a more sustainable business model?"**

During these phases, the previously developed business case is **tested, evaluated, and refined through real-life application**. Companies gather evidence on feasibility, performance, and impact, and use these insights to strengthen and adjust their approach.

The outcome of these phases is a **validated and evidence-based sustainable business case that demonstrates how the business model can be adapted**, providing a foundation for an economically successful circular product development.



5 PILOTING

The piloting phase represents the **transition from conceptual work to practical application**. It involves **testing** the developed business case concepts in real-life conditions within the company.

Piloting is not about achieving perfection, but about **learning and improving**. **Adjustments to the business model** are expected and encouraged based on insights gained during testing.

Piloting is typically **conducted on a small scale**, allowing companies to experiment without significant risks. Activities may include **testing a new product or service, implementing a new process, or engaging a specific customer segment** in order to:

- validate assumptions,
- identify practical challenges,
- assess customer response
- measure potential impact.

Monitoring and feedback collection are key components of this phase. Companies systematically gather data and reflect on their experiences, often supported by facilitators.

In manufacturing, piloting is particularly critical and complex due to real production constraints. It must balance experimentation with operational reliability:

- Testing often occurs in limited production environments or small batches
- Need to avoid disruption of ongoing operations

Focus on: **technical feasibility, production stability, quality control, data collection** (resource savings, cost implications)

KEY OUTCOME:

Validated and refined business case, supported by practical evidence.

6 ADAPTATION

The **final phase** focuses on **adapting and refining** the business model based on the insights gained during piloting.

Using the results from testing and feedback collection, companies assess how the solution can be **effectively integrated into their existing operations and strategic objectives**. This may involve **organisational changes, further investment, or strategic alignment.**

Companies also consider **long-term sustainability impacts and monitoring mechanisms**

- **Support from regional stakeholders** can play an important role in this phase, for example by facilitating **networking, funding opportunities, or policy alignment.**

In manufacturing companies, adaptation often requires significant **operational and organisational adjustments**, including:

- **Integration** into existing production lines and processes
- Potential need for new **equipment, supplier changes, workforce training**
- **Alignment** with long-term production strategies



KEY OUTCOME:

An adapted business model that embeds the validated sustainable MVP within the company's activities and supports its wider implementation and growth.



TOOLBOX:

The tools and templates supporting this phase are provided in the 🔗 Methodology kit Annex - Practical tools and templates under the section **Circular business model templates and Practical recommendations**

SECTOR-BASED CIRCULAR INNOVATION CASES FROM CURIOST

MECHANICS & MECHATRONICS

Microsport GmbH & Co. KG

Germany

REVERSE LOGISTICS AND MULTI-LIFE STRATEGY FOR ECHECKER TEST BENCHES

Microsport developed a circular business model to address the lack of structured reverse logistics for durable testing equipment. Instead of treating eChecker test benches as one-time sales, the company introduced a **buy-back, refurbishment, and rental system** that extends product lifetimes and creates **recurring revenue streams**. The model includes **predefined repurchase values, residual-value assessments, and product reminders** to encourage returns and ensure predictable return flows. Refurbished units can then be resold or offered through rental and subscription models, opening **new customer segments** and **increasing product utilisation**.

Microsport also embeds **circular design principles - modularity, repairability, interchangeability** - into future product development, strengthening supply chain resilience and reducing dependency on new components. This is especially important in a sector affected by global supply disruptions.

ebike-checker.de/en

PACKAGING

HeroPAK

Austria

PACKAGING-AS-A-SERVICE MODEL REPLACING SINGLE-USE PLASTIC STRETCH FILM WITH REUSABLE SYSTEMS AND IOT TRACKING

HeroPAK offers a fully circular, operationally proven alternative to single-use stretch film in logistics, one of the largest sources of packaging waste in Europe. Its **reusable ClickLOK system** replaces disposable film with a durable, trackable solution that significantly **reduces plastic waste, CO_2 emissions, and hidden operational costs**. HeroPAK also integrates **IoT tracking**, enabling real-time monitoring, compliance reporting, and transparent environmental impact assessment.

The company's **Packaging-as-a-Service (PaaS) model** is particularly innovative. Instead of selling packaging, HeroPAK provides a **complete lifecycle service** that includes deployment, maintenance, repair, and end-of-life management. This shifts logistics packaging from a linear cost item to a circular, data-driven service.

heropak.io

PLASTICS

KLGS

Poland

FUNCTIONAL UPCYCLING OF TECHNICAL PLASTICS WITH ADDITIVES FOR HIGH-PERFORMANCE COMPONENT

KLGS tackles one of the most difficult challenges in the plastics sector: the reuse of post-production waste that contains functional additives such as fibres, flame retardants, and stabilisers. These materials are normally hard to recycle without losing quality, but KLGS develops **functional upcycling technology** that restores and stabilises their mechanical and functional properties. This allows **materials like PP, ABS, PC/ABS and PC to be reused in high-quality technical components**, rather than being downcycled or discarded. The company combines decades of injection-moulding experience with strong R&D partnerships with leading technical universities, giving it the scientific and technological capacity to create **reliable, high-performance recyclates**.

KLGS is also transforming its business model from a traditional component manufacturer into a technology partner offering **material development, process optimisation and consulting**. This makes its circular approach highly transferable to other plastics SMEs.

klgs.eu

BUILDING & CONSTRUCTION

Reciklaža Mišić

Croatia

CIRCULAR USE OF CONSTRUCTION AND DEMOLITION WASTE

Reciklaža Mišić has developed a practical circular solution for construction and demolition waste (CDW), a growing challenge in the construction sector. Instead of treating surplus processed materials as waste, the company **collects, sorts, and processes construction debris into valuable secondary raw materials**.

Its MVP focuses on producing **horticultural and small construction products**, such as garden paving slabs, made from recycled aggregates. This approach enables rapid market entry while avoiding complex certification requirements and demonstrating the commercial value of recycled construction materials.

Reciklaža Mišić offers a credible, scalable, and sector-relevant circular model that **reduces waste, creates new revenue streams**, and demonstrates how SMEs can successfully implement circularity in the building & construction sector.

reciklaza-misic.hr

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