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**Project Acronym: Cradle-Alp**
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# D.1.4.3

# C2C guidance book
# Lego Serious Play

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| **WP n°:** | **1** |
| **Task n°:** | **A1.4** |
| **Author(s):** | **PP5 Business Upper Austria** |
| **Contributors:** | **/** |
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This project is co-funded by the European Union through the Interreg Alpine Space programme.

**WHAT - Purpose of the tool – what is it used for? For which results?**

Adopting new perspectives on existing issues is of central importance for the successful implementation of a green transformation. Creative methods such as LEGO® SERIOUS PLAY® (LSP) are methods that are well suited to dealing with complex issues and conflict-laden topics.

Hierarchies are left out of these methods and the topics are dealt with in an abstract form, which enables a value-free discussion of the topic itself and potential conflicts can be avoided. The topics are viewed holistically, and the use of several senses (haptics, articulation, discussion) ensures a higher level of engagement and a comprehensive consideration of the topics. Different perspectives and relationships between them can be worked out and illustrated well.

For example, these methods are well suited to dealing with anticipated events with a significant impact.

**WHAT - Description**

Lego Serious Play (LSP) is a facilitated meeting, communication, and problem-solving method in which participants use Lego bricks to build models representing their ideas, thoughts, and reflections.

*1. Lego Bricks*

The core element of LSP is the use of specially selected Lego bricks. Often when discussing the method people question the name and are unsure, whether it is truly the toy that is meant by the method, which is why it is again stated and clarified here: yes, Lego Serious Play does in fact use the very same Lego bricks that most people know as a toy from their childhood. The bricks come in various shapes, sizes, and colors, allowing participants to construct models that symbolize their thoughts, ideas, and solutions to problems. The physical act of building with bricks enables abstract concepts to be expressed in a tangible form.

*2. Facilitator*

A trained LSP facilitator guides the session. The facilitator's role is to introduce the exercises, ask guiding questions, ensure that all participants are engaged, and help interpret the models built by participants. The facilitator ensures that the process flows smoothly and that the objectives of the session are met. Proof of certification can look like this:

*3. Core Process Steps*

The LSP methodology typically follows a structured process with these core steps:

Challenge: The facilitator poses a question or challenge to the participants. Usually, a contact person from the company and the facilitator have discussed this question before to ensure that the content of the workshop fits the needs of the company.

Build: Participants individually build a model in response to the challenge using Lego bricks. Time is limited as to not go into perfectionism and rather to stay creative and engaged.

Share: Each participant shares the story of their model with the group. Questions are encouraged, both for the other participants to understand and for the builders themselves to truly think about their build.

Reflect: The group reflects on the models and the stories to extract insights and knowledge. Based on this now gained knowledge a shared model is created that requires the agreement of every group member and focuses on portraying all relevant aspects of the individual problems summarized into one Lego-structure.

*4. Application Techniques*

LSP uses specific application techniques tailored to different objectives:

- Building Individual Models: Participants build their own models to reflect personal perspectives.
- Building Shared Models: Participants collaborate to build a model representing a shared understanding or vision.

As for our (Biz-up) experience, we usually apply both, having participants build their own model first and then have the groups create a shared model that combines the individual viewpoints.

Photo: © Biz-up

*5. Guiding Principles*

LSP is grounded in several key principles:

Imagination and Play: Leveraging the power of imagination and the playful nature of Lego to enhance creativity and engagement.

Hands-on, Minds-on Learning: Using hands to build models engages the mind in deeper thinking and learning processes.

Inclusive Communication: Ensuring every participant has a voice and can contribute to the discussion through their models.

Lego Serious Play is a dynamic and interactive tool utilizing Lego bricks, guided facilitation, structured processes, and specialized kits to unlock creativity, enhance communication, and solve complex problems. Its hands-on approach makes abstract concepts tangible and ensures inclusive participation, making it a powerful methodology for personal and organizational development.

**HOW - How to implement it – recommendations on how to use the tool**

*Preliminary Activities and Inputs*

Using Lego Serious Play (LSP) effectively requires the involvement of a certified expert. While the tool itself demands a certain level of expertise, we provide initial insights to help determine the appropriate circumstances for its application. Every partner organization must seek out a local expert to conduct the workshops. This initial step is crucial to ensure that the tool is used effectively, and the desired outcomes are achieved.

*Delivery Process*

The primary mode of delivery for Lego Serious Play is through workshops facilitated by an external expert. These workshops are interactive sessions where participants use Lego bricks to model solutions to their issues. The expert guides the participants through the process, ensuring that they engage deeply with the task and derive meaningful insights.

*Duration and Implementation Steps*

A typical Lego Serious Play workshop lasts at least half a day, though a full day is ideal to delve into the details. Ideally, there are at least 6 participants, though it is advised to have no more than 20 for the sake of keeping moderation manageable. This results in about 4-5 groups with 3-6 participants each. In addition, the groups should be mixed, LSP is great for bringing people from different departments and with different roles and responsibilities to the same table. The workshop is structured to allow participants to explore the problem, build models, and discuss their solutions. Following the workshop, it is up to the company to take the findings and develop individual implementation strategies. This ensures that the insights gained are translated into practical actions that address the specific needs of the organization.

*Involvement and Roles*

A certified trainer, who has the expertise to facilitate the process effectively, leads the workshop. The trainer will determine the most suitable participants within the company based on the specific problem being addressed. The Cradle-ALP project partners play a crucial role in facilitating the connection between the certified facilitator and the company, ensuring smooth communication and coordination.

*Specific Requirements*

In the context of the Cradle-ALP project, we as PP5 (Biz-up) provide the initial overview, helping project partners understand when and where the tool might be beneficial. This preliminary insight allows partners to identify which of their SMEs could benefit from the tool. However, the actual training and facilitation of the workshop require a local certified facilitator to ensure the tool's proper application and effectiveness.

*Practical Recommendations*

For a successful implementation of Lego Serious Play, thorough preparation is key. It is highly beneficial to have a clear and detailed briefing at the outset. The company should have a well-defined problem or question that they wish to address before entering the workshop. This clarity allows the workshop to be more focused and productive, leading to better and more actionable outcomes.

By following these guidelines and ensuring the involvement of certified experts, Lego Serious Play can be a powerful tool for problem-solving and innovation within organizations.

**WHY – What are the specific advantages of the methods?**

Lego Serious Play improves communication by allowing complex ideas to be visualized and shared in a relaxed environment, deepening understanding. It enhances collaboration by engaging all participants, promoting active listening and diverse perspectives. The method stimulates creative problem-solving, breaking conventional thinking patterns. Additionally, it aids decision-making by exploring scenarios from a high-level perspective, creating a common basis for informed decisions.

Photo: © Biz-up

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# C2C guidance book

# Life Cycle Assessment

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## Contents

# 1. Life Cycle Assessment (LCA) – Main objectives and purpose

Life Cycle Assessments (LCAs) are systematic analyses used to evaluate the environmental impacts of products, processes, or services throughout their entire life cycle. This includes all stages from raw material extraction, manufacturing, distribution, use, to disposal or recycling. The main goal of an LCA is to assess the cumulative environmental impacts associated with all the stages of a product's life.

The main objectives and purposes of conducting an LCA:

- **Environmental Impact Assessment:** LCA helps to identify and quantify the environmental impacts of a product, process, or service at every stage of its life cycle, including energy consumption, resource use, waste generation, and emissions to air, water and soil.
- **Decision support:** LCA provides a scientific basis for decision-making in product development, policy-making and strategic planning by highlighting areas where environmental improvements can be made.
- **Identifying improvement opportunities:** LCA helps to identify opportunities to reduce environmental impacts and resource use across the product's life cycle. This can lead to more sustainable product design and development.
- **Comparative analysis:** It allows for the comparison of environmental impacts of different products, processes, or services, which can make it easier to choose between alternatives.
- **Stakeholder communication:** LCA results can be communicated to stakeholders, including customers, regulatory bodies and investors, demonstrating a commitment to sustainability and environmental responsibility.
- **Compliance and certification:** Conducting an LCA can help organizations comply with environmental regulations and standards and achieve certifications such as ISO 14040 and ISO 14044.
- **Market advantage:** By improving environmental performance, companies can gain a competitive advantage in the market, as consumers and businesses increasingly prefer environmentally friendly products.

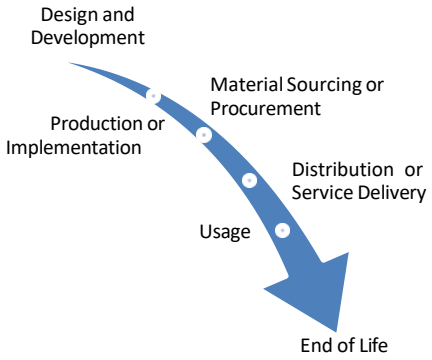
LCAs are particularly useful for the upcoming reporting requirements of the EU, but as mentioned above, they also allow for product optimization along the several phases of life a product has. Furthermore, they also allow for green-washing free marketing as they provide factual data for the company to rely on when publicly communicating green claims.

In summary, these assessments are done to either improve an existing product or to determine values on a new product. In any case, they can be found at the beginning of the transformation, either within the context of innovating something already there or by pre-determining certain factors prior to the production of the innovation.

Relevant in and of itself are not so much the results but what the company makes of them. In any case, LCAs and their results serve as an excellent base for informed decision making, a holistic overview of their products' environmental impacts as well as the opportunity to communicate openly and transparently while also taking accountability for said impact.

## 2. Description

Typically, the life cycle of a product or a service consists of the following stages:

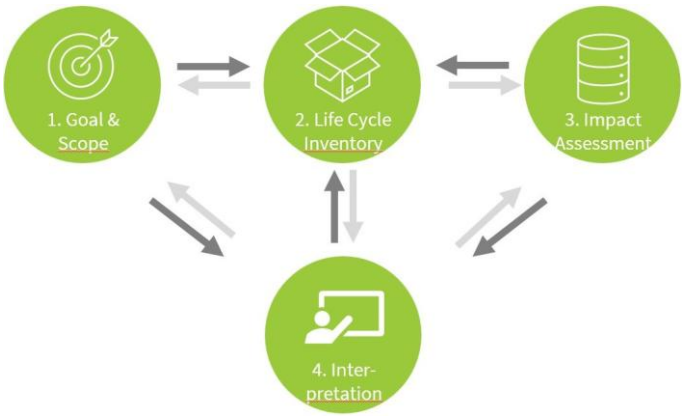



A LCA analyzes all these stages with the aim to identify and quantify the environmental impact of a product or service.

The most common standards for conducting a LCA can be found in ISO 14040 and ISO 14044. ISO 14040 defines Life Cycle Assessment as follows: "LCA studies the environmental aspects and potential impacts throughout a product's life cycle (e.g. cradle-to-grave) from raw material acquisition through production, use and disposal. The general categories of environmental impacts needing consideration include resource use, human health and ecological consequences.

A Life Cycle Assessment consists of four phases:

1. Definition of Goal and Scope
2. Inventory Analysis
3. Impact Assessment
4. Interpretation




own graphic based on ISO, 2006-a, p.8

**Goal and scope:** This step is all about the question "What exactly do we want to analyze and in which depth are we interested to go." A clear focus and goal are crucial when deciding which product or service will be analyzed and why. Reasons can be manyfold, e.g. if you want a more sustainable product design or if it is necessary for keeping up with certain regulations.

The next step is the specification of system boundaries (processes included, e.g. raw material extraction, manufacturing, distribution etc.; geographical boundaries e.g. local, regional, global; temporal boundaries, e.g. product lifespan) and the level of detail in which the assessment should take place.

**Inventory collection (LCI):** This step consists of the collection of relevant data on inputs (e.g. raw materials, energy, etc.) and outputs (e.g. emissions, waste) for each process within the system boundaries. In addition, a process flow diagram is created which is a chart of all processes involved in the life cycle. Inputs and outputs are quantified for each unit process.

**Impact assessment (LCIA):** In the impact assessment, the results of the inventory collection are classified in different environmental impact categories, f.e. human toxicity, ecotoxicity, acidification, global warming etc. The classified data is then converted and aggregated in common units in order to calculate the potential impacts.

**Interpretation:** Significant environmental issues can be identified by analyzing the results of the previous steps. The interpretation phase helps turning the LCA's learning into action. The interpretation can be done by creating a report, but this is not necessary. The interpretation should include the identification of significant findings from the inventory collection and the impact assessment, and the evaluation of the whole LCA, taking into account completeness, sensitivity and consistency. From this point on conclusions can be drawn.

## 3. Implementation

Implementing a LCA takes several steps (short description in chapter 2) and considerations to ensure that the process is valid and accurate:

**Preliminary activities:** As mentioned above, the objectives and the scope of the LCA have to be clarified. Stakeholders who will be involved in the process have to be identified (e.g. internal teams, external experts etc.). Preliminary data on the product or service being assessed have to be gathered. The next step is the selection of fitting LCA software (basically an LCA can be done with pen and a sheet of paper, but it can get really complicated without using software). One of the preliminary activities is also the identification of environmental impacts that have to be assessed, such as climate change or resource depletion.

**Delivery process:** Data collection is crucial through the whole LCA, especially in the Inventory Collection. Interviews with key personnel to collect detailed information about the processes, materials etc., workshops to gather insights, questionnaires for data collection and a systematic data collection can all be used when conducting an LCA. A combination of the

activities is often used.

The **duration** of a LCA varies depending on the complexity of the task, but typically it can take from 2 to 6 months.

**Key participants:** LCA experts, project manager who coordinates the LCA, data providers (from different departments), internal (e.g. management) and external (e.g. customers, suppliers) stakeholders

**Specific requirements:** Data access is crucial when conducting a LCA because very detailed data is needed, e.g. on materials, energy use, emissions, waste etc. Also, valid licenses for the suitable tool are necessary as well as personnel who has expertise in LCA.

**Practical recommendations:** The definition of clear and achievable objectives is a crucial starting point. The data collection should be thorough and accurate. Involve stakeholders throughout the process to gain insights and validate findings. The use of specialized LCA software makes the management and analysis of data effective. Let the process stay iterative, and refine the scope as needed. The results of the LCA should be used for continuous environmental improvement and the findings incorporated into ongoing sustainability efforts. To ensure transparency and reproducibility, all steps, data sources and assumptions should be documented.

## 4. Advantages of the method

Life Cycle Assessment offers a comprehensive approach to evaluating the environmental impacts of products and services throughout their entire life cycle, providing a holistic view that includes multiple impact categories and identifies key hotspots for targeted improvements. LCA supports transparent stakeholder communication and credible environmental claims, aiding in regulatory compliance and fostering trust. Economically, it helps reduce cost through improved resource efficiency and waste reduction, while strategically offering a competitive advantage by enhancing brand reputation and driving innovation. LCA also facilitates continuous improvement by tracking environmental performance and managing risks within the supply chain and regulatory landscape. Its methodological rigor, following recognized standards, ensures consistency and credibility, while its adaptability allows for customization across various industries and scopes.

**Repository of LCA tools:**

In the frame of Cradle-ALP project Business Upper Austria has commissioned a master's thesis to analyze the most relevant software tools for LCA in five sectors (wood and furniture, textile, polymer/composites, chemistry/materials, packaging). The activities of the master thesis consist of creating a general overview of available LCA tools and categorize them, and the test and comparison of selected tools. As part of the project, we will be able to give companies a good overview on LCA tools that could be fitting for them. The overview that is being provided caters directly to the companies addressed by the project while also allowing the companies to make their own decisions based on the different analyzed parameters like software properties,

data usability, flexibility, analysis options etc. This gives companies the freedom to still determine which factors are most important to them and as a result, which tool would be ideal for them. The repository will be available in October.

**Annexes as necessary/available:**

Life Cycle Assessment (LCA) – Everything you need to know | Ecochain

European Platform on LCA | EPLCA (europa.eu)

What is life cycle assessment (LCA)? | Golisano Institute for Sustainability | RIT

US EPA Life Cycle Assessment: Principles and Practice

Dicks, A.P. Hent, A. (2015). An Introduction to Life Cycle Assessment. In: Green Chemistry Metrics. SpringerBriefs in Molecular Science. Springer, Cham.

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# C2C guidance book
# Circularity Compass

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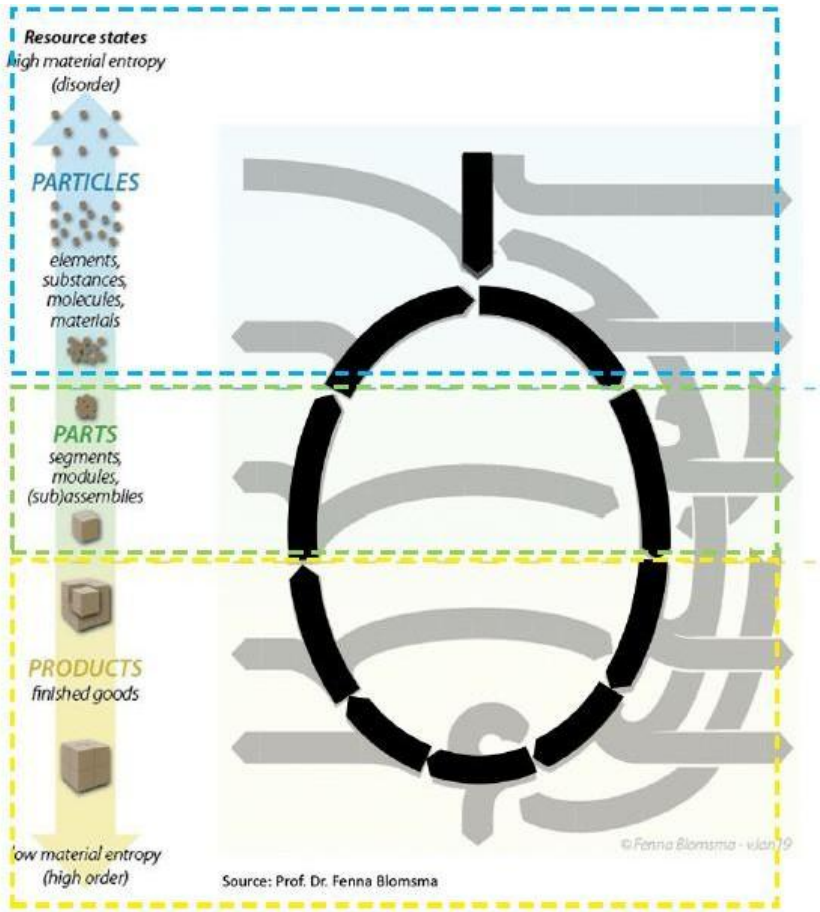
## Contents

# 1. Introduction to Circularity Compass Tool

The Circularity Compass was developed within the framework of EIT Climate-KIC, Europe's leading climate innovation initiative. It is part of a larger circular economy framework known as Circularity Thinking, which aims to accelerate the transition to a zero-carbon economy by fostering innovation and sustainable practices. This approach is based on the research of Professor Dr. Fenna Blomsma (University of Hamburg), following a feasibility study in which 150 organizations were surveyed to identify gaps and needs in circular knowledge.

The Circularity Compass helps businesses map and visualize resource flows, identify opportunities for reducing waste, and enhance resource efficiency. By supporting the development of circular business models, it aligns with Climate-KIC's goals of mitigating climate change and promoting long-term environmental and economic sustainability.




[1]

[1] The 'Circularity Compass' is part of the 'Circularity Thinking' tool series by Blomsma, Brennan and Tennant. Please use the tool according to the copyright.

## 2. Purpose of the Tool – What is it used for? For which results?

The Circularity Compass is a strategic tool designed to map and visualize resource flows through different stages of a product's lifecycle in a circular economy. It helps businesses and organizations identify opportunities for reducing waste, enhancing resource efficiency, and creating sustainable value by transforming linear (take-make-dispose) models into circular (regenerate and restore) systems. The primary purpose of the Circularity Compass is to facilitate the transition towards a circular economy by provide a clear and structured framework for analyzing and optimizing resource use. It can be utilized by a wide range of stakeholders across different sectors, from businesses and corporations to sustainability planners and consultants, policy makers and public sector organizations, educational and research institutions, etc. It is recommended to use it in workshops where various stakeholders are present, each bringing their own perspective. There are different contexts in which tool can be used:

- **Product Development**: Integrate circular design principles from the outset to ensure products are designed for longevity, reparability, and recyclability.
- **Supply Chain Management**: Optimize resource use and reduce waste throughout the supply chain by identifying inefficiencies and potential areas for improvement.
- **Sustainability Planning**: Develop comprehensive sustainability strategies that align with corporate goals and regulatory requirements.
- **Circular Economy Initiatives**: Transition existing business models towards circularity, ensuring sustainable and resilient operations.

There are different results businesses and other stakeholders can expect to get from the tool:

- Enhanced understanding of resource flows and waste streams, allowing for better decision-making and strategic planning.
- Identification of potential circular strategies that can be implemented to improve sustainability and resource efficiency.
- Improved resource efficiency and sustainability, leading to cost savings and reduced environmental impact.
- Strategic planning for long-term value creation, ensuring the business remains competitive and sustainable in the future.
- Reduction in environmental impact and resource depletion, contributing to global sustainability goals.
- Increased innovation in product design and business models, fostering a culture of continuous improvement and adaptation.

## 3. Main elements of the tool

The Circularity Compass provides a comprehensive framework to illustrate how resources transition through various states in the economy—from raw materials to finished products and back through reuse, recycling, and remanufacturing processes. It consists of three main layers, representing the journey of resources:

**1. Particles State**: Resources are in their elemental or molecular forms (e.g., raw materials, bulk substances). This phase involves processes such as extraction, purification, and preparation of materials. For example, in the mining and smelting of metals, the raw ores are transformed into purified metal ingots ready for further processing.

**2. Parts State**: Resources are transformed into components and intermediates (e.g., parts, sub-assemblies). This phase includes manufacturing and assembling parts into modules. For instance, the purified metals are used to create various parts of a product, such as the chassis and body panels of a car.

**3. Products State**: Final products are created and delivered to end-users. This includes the assembly of finished goods, packaging, distribution, and use by consumers. At this stage, the car is fully assembled, packaged, and distributed to dealerships for sale to consumers. The tool uses arrows to indicate resource flows, demonstrating how inputs (materials, parts) enter the system and outputs (products, waste) exit it. It can also highlight the recirculation of resources within the system or between different systems, promoting reuse and minimizing waste.

The key features of the tool are:

- **Visual Representation**: Simplifies complex resource flows into an understandable format, making it easier for stakeholders to grasp the concepts of circularity.
- **Three Layers**: Particles, Parts, and Products states to cover all phases of resource transformation, ensuring a comprehensive analysis.
- **Input and Output Arrows**: Show how resources enter and leave the system, including potential recirculation, highlighting opportunities for improvement.
- **Flexibility**: Can be applied at different scales—product level, sector level, or entire economy level, making it a versatile tool for various applications.

# 4. How to Implement the Circularity Compass

This chapter is meant to explore the implementation of the Circularity Compass. Annex 1 contains detailed instructions on how to use it. The steps for the successful implementation:

**Preparation and Assessment**:

Begin with a thorough assessment of the current business model, focusing on identifying linear practices and their environmental and social impacts. Gather data on resource use, waste production, and supply chain operations. Define the scope and boundaries of the analysis, such as whether it will focus on a single product, a production line, or the entire sector.

**Stakeholder Engagement**:

Engage key stakeholders, including employees, customers, suppliers, and community members, to gather diverse perspectives and insights. Encourage collaboration to identify opportunities for circular practices and innovations.

**Workshop and Brainstorming**:

Conduct workshops and brainstorming sessions to explore how circular principles can be integrated into the business model. Use the Circularity Compass as a framework to map out changes and new strategies in each area.

**Design and Planning**:

Develop detailed plans for implementing circular strategies, focusing on product design, resource sourcing, production processes, and end-of-life management. Identify necessary changes in partnerships, logistics, and customer engagement.

**Pilot and Test**:

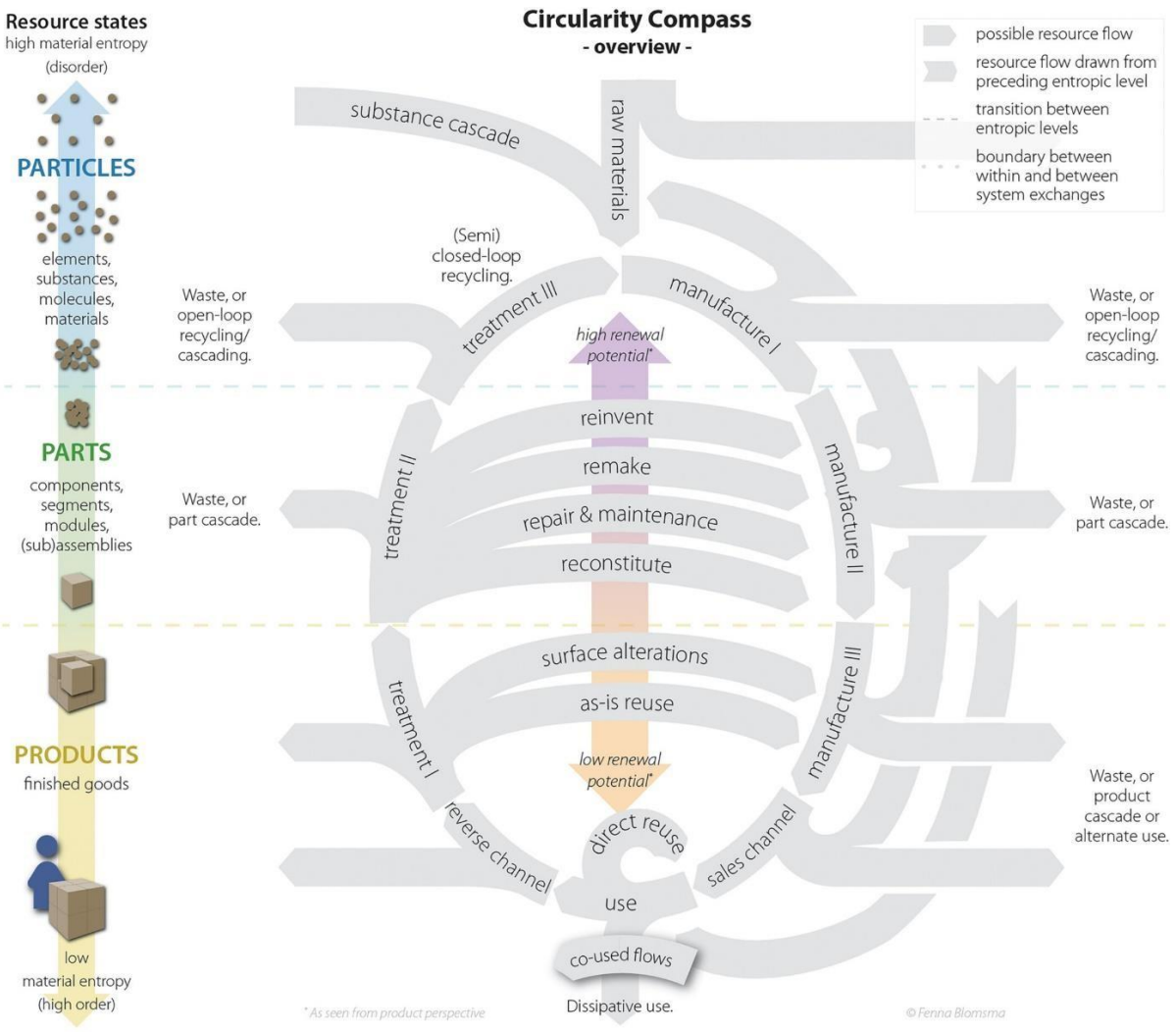
Implement pilot projects to test circular initiatives on a small scale, allowing for experimentation and learning. Gather feedback and refine the strategies based on real-world outcomes.

**Full-Scale Implementation**:

Scale successful circular initiatives across the business, integrating them into standard operations. Continuously monitor and evaluate performance to ensure ongoing improvement and alignment with circular principles.

**Continuous Improvement**:

Treat circularity as a dynamic process, continuously seeking new opportunities for improvement and innovation. Regularly review and update the Circularity Compass to reflect changes in the business environment and advancements in circular economy practices.

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|---|---|
| **Recycling** *(multiple options in diagram)* | The process where a material undergoes a chemical transformation or changes its physical state to return to a 'virgin-like' state, or as close to this state as possible. |
| **Cascading** *(multiple options in diagram)* | Value/ utility extraction along a trajectory of increasing entropy, by means of redefining the value/ utility/ suitability of material properties at each stage of the trajectory. |
| **Reinvent** | Creating the product and its properties anew within the confines offered by the modules it consists of. |
| **Remake** | Restoring or improving (parts of) the product through remanufacturing, refurbishment, and upgrading. |
| **Maintenance** | Operations such as cleaning and repair that require (partial) disassembly. |
| **Reconstitute** | Allowing for the flexible use of product capacity by returning parts or modules to their predefined positions. |
| **Surface alterations** | Alterations to the product that do not require disassembly. |
| **As-is reuse** | Reuse of the product without significant alterations (i.e. redistribution). |
| **Direct reuse** | Direct reuse by user that is an alternative to single use. |
| **Co-used flows** | Material flows that are not contained in the final offering, but that are used with or by the product, such as consumables, or water and chemicals required for cleaning. |

## 5. Why Use the Circularity Compass?

The Circularity Compass is essential for businesses aiming to transition to a circular economy. It provides a holistic understanding of resource flows, which is crucial for identifying inefficiencies and opportunities for improvement. By mapping out the entire lifecycle of products and materials, businesses can make informed decisions that enhance resource efficiency and sustainability. This tool supports the development of strategies that minimize environmental impact, promote sustainability, and foster innovation in product design and business models.

Using the Circularity Compass helps businesses meet regulatory requirements related to waste management and sustainability, ensuring compliance with current and future regulations. It also enhances stakeholder engagement by providing a clear visual representation of resource flows and circular strategies, facilitating communication and collaboration among employees, suppliers, and customers.

Moreover, the Circularity Compass positions businesses as leaders in sustainability, enhancing brand reputation and attracting eco-conscious customers and investors. By adopting circular strategies, companies can create long-term value for themselves, the environment, and society. This tool not only promotes resource efficiency and waste reduction but also drives innovation and long-term success in an increasingly eco-conscious marketplace.

## 6. Advantages of the Circularity Compass

The Circularity Compass offers key advantages for businesses pursuing sustainability by providing a comprehensive view of resource flows and circular opportunities. Its flexibility allows application from products to industries. By mapping resource flows, it identifies critical areas for sustainability improvements, fostering strategic insights.

The tool encourages collaboration and stakeholder engagement, enhancing support for sustainability initiatives. It promotes resource efficiency, cost savings, and environmental performance through data-driven decision-making. Regular updates ensure adaptability and continuous improvement, keeping businesses resilient and innovative.

## 7. Sources


- [EIT Climate-KIC] https://www.climate-kic.org/spotlight-initiatives/circularity-thinking-programme/ - Article on Circularity Thinking Programme by EIT Climate-KIC
- [EIT Climate-KIC] - Circularity Compass - An Introduction – Study material from Circularity Thinking Programme by EIT Climate-KIC (attached as Annex 1)[2]
- [Ontology-based Decentralized Sharing of Industry Data in the European Circular Economy – Horizon Europe project] https://ontodeside.eu/wp-content/uploads/2023/08/Onto-DESIDE_WP6_Deliverable_D6.1_v1.0_final.pdf - Use Case Needs Analysis and Circular Value Flow Mapping
- [Business Strategy and the Environment, Volume 32, Issue 3] https://onlinelibrary.wiley.com/doi/full/10.1002/bse.3107 - Academic paper on sustainable business model innovation.


## 8. Annexes

- Circularity Compass - An Introduction (Study material from Circularity Thinking Programme by EIT Climate-KIC)
- Circularity Compass PDF
- Circularity Compass Annotated PDF

[2] The attached study material is allowed to be used and shared, but always with the logo and mention of EIT Climate-KIC and professor dr. Fenna Blomsma.

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# C2C guidance book
# Tool description
# Sustainable Business Model Canvas

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Contents

## 1. Purpose of the tool – what is it used for? For which results?

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 SBMC can be applied in various contexts, spanning different stages of business development, sectors, and organizational goals. Here's a detailed look at some key contexts where the SBMC can be particularly valuable:

| Users | Context | Expected Results |
|---|---|---|
| **Startups and New Ventures** | ▪ **Early-Stage Planning:** Startups and new ventures can use the SBMC from the outset to embed sustainability into their core business strategy. This is crucial for attracting eco-conscious investors and customers.<br>▪ **Market Differentiation:** In competitive markets, new businesses can differentiate themselves by prioritizing sustainable practices and value propositions. | ▪ **Clear Vision and Mission:** Startups gain a structured approach to integrate sustainability into their business model, aligning their mission with long-term ecological and social goals.<br>▪ **Attracting Investment:** Enhanced appeal to investors who prioritize ESG (Environmental, Social, Governance) factors.<br>▪ **Customer Loyalty and Market Position:** Building a loyal customer base that values sustainable products or services, leading to stronger market positioning. |
| **Established Businesses Seeking Transformation** | ▪ **Business Model Reinvention:** Established companies can use the SBMC to pivot or transform their existing models towards more sustainable practices, often driven by regulatory pressures, market demands, or internal sustainability goals.<br>▪ **Corporate Social Responsibility (CSR)**: Companies can integrate CSR initiatives more deeply into | ▪ **Enhanced Reputation**: Improved brand reputation and customer trust through transparent and committed sustainability practices.<br>▪ **Operational Efficiency:** Potential for cost savings through resource efficiency and waste reduction.<br>▪ **Regulatory Compliance and Risk Management:** Proactive adaptation to regulatory changes and reduced risk |

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| | their core operations, moving from peripheral projects to fundamental business drivers. | exposure related to environmental and social governance issues. |
| **Non-Profit and Social Enterprises** | ▪ **Mission Alignment:** Non-profits and social enterprises can use the SBMC to ensure their operations and business strategies are aligned with their social and environmental missions.<br>▪ **Funding and Resource Allocation:** Clarifying how their business model supports sustainability can help in securing funding and optimizing resource use. | ▪ **Mission-Driven Growth:** Better alignment between operations and organizational mission, leading to more impactful programs and initiatives.<br>▪ **Stakeholder Engagement**: Stronger engagement and support from stakeholders, including donors, volunteers, and the communities they serve.<br>▪ **Sustainable Funding:** Diversified and sustainable revenue streams that support long-term viability and mission impact. |
| **Public Sector and Government Initiatives** | ▪ **Policy Implementation:** Government and public sector agencies can apply the SBMC to design and implement programs that address social and environmental challenges.<br>▪ **Community Development:** Local governments can use the SBMC to support community-focused projects that promote sustainability and economic development. | ▪ **Effective Policy Delivery:** More effective and sustainable delivery of public services and policy initiatives.<br>▪ **Community Impact:** Enhanced community well-being through projects that promote environmental stewardship and social equity.<br>▪ **Public-Private Partnerships:** Opportunities for collaboration with private sector businesses that align with public sector sustainability goals. |
| **Industry and Sector-Specific Applications** | ▪ **Sector-Specific Adaptation:** The SBMC can be tailored to specific industries, such as manufacturing, retail, or technology, to address unique sustainability challenges and opportunities.<br>▪ **Supply Chain Management:** Companies can use the SBMC | ▪ **Sector Leadership:** Establishing a leadership position within the industry by setting high sustainability standards.<br>▪ **Supply Chain Resilience:** Building more resilient and ethical supply chains that can adapt to changes and reduce |

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| | to develop more sustainable supply chains, reducing environmental impact and enhancing social responsibility across their network. | risks.<br>▪ **Innovative Solutions:** Fostering innovation in product design, sourcing, and manufacturing processes that reduce environmental impact. |
| **Educational and Research Institutions** | ▪ **Curriculum Development:** Universities and colleges can incorporate the SBMC into their business and sustainability curricula, preparing students to integrate sustainability into their future careers.<br>▪ **Research and Innovation:** Research institutions can use the SBMC to structure projects and initiatives focused on sustainability and social impact. | ▪ **Educated Workforce:** Graduates with a strong understanding of sustainable business practices, ready to lead and innovate in their careers.<br>▪ **Research Outcomes:** Advancements in sustainable technologies and practices that can be applied in various sectors.<br>▪ **Collaborative Opportunities:** Enhanced collaboration with businesses and non-profits on sustainability-focused projects. |

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. The expected outcomes range from competitive advantage and operational efficiency to enhanced stakeholder engagement and positive societal impact.

## 2. Description

The traditional Business Model Canvas encompasses the following components:

- Value Propositions
- Customer Segments
- Channels
- Customer Relationships
- Revenue Streams
- Key Activities
- Key Resources
- Key Partners
- Cost Structure

They are typically summarized in a canvas view as follows:


There are different SMBC tools available on the market, which build on the traditional BMC. Two examples are displayed hereafter:

**Triple Layered Business Model Canavs**

The Triple Layered Business Model Canvas – A Tool to Design More Sustainable Business Models | Sustainable Business Model.org

The triple layered business model canvas: A tool to design more sustainable business models - ScienceDirect

The Triple Layer Business Model Canvas (TLBMC) is an innovative tool designed to help businesses integrate sustainability into their strategic planning. Developed by Alexandre Joyce and Raymond Paquin, this framework extends the traditional Business Model Canvas by adding two additional layers—one for environmental impact and one for social impact. This multi-dimensional approach provides a comprehensive view of a business's value creation across economic, environmental, and social dimensions, making it particularly valuable for companies aiming to adopt sustainable and responsible practices.

The TLBMC consists of three interrelated layers:

1. **Economic Layer:** This is similar to the traditional Business Model Canvas and focuses on the financial aspects of the business.
2. **Environmental Layer:** This layer evaluates the business model's environmental impacts, emphasizing sustainability and eco-efficiency.

3. **Social Layer:** This layer assesses the social implications of the business model, considering its effects on stakeholders and societal well-being.

Each layer is broken down into nine components, mirroring the structure of the traditional Business Model Canvas but with specific focuses tailored to each dimension.

**1. Economic Layer**

The Economic Layer corresponds to the traditional Business Model Canvas developed by Alexander Osterwalder and Yves Pigneur. It encompasses nine building blocks that describe how a company creates, delivers, and captures value financially:

- **Value Proposition:** The unique products or services that provide value to customers.

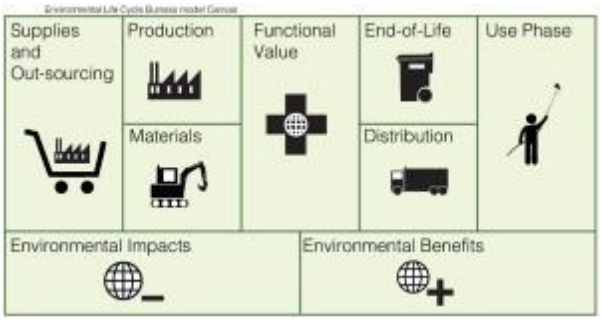
- **Customer Segments:** The different groups of people or organizations a business aims to reach and serve.
- **Channels:** The means by which a company delivers its value proposition to its customer segments.
- **Customer Relationships:** The types of relationships a company establishes with its customer segments.
- **Revenue Streams:** The ways a company generates income from each customer segment.
- **Key Resources:** The critical assets required to deliver the value proposition.
- **Key Activities:** The essential actions a company must perform to deliver its value proposition.
- **Key Partnerships:** The network of suppliers and partners that help the business operate.
- **Cost Structure:** The expenses involved in operating the business model.


## 2. Environmental Layer

The Environmental Layer focuses on assessing and improving the environmental sustainability of the business model. It includes components that help businesses evaluate their ecological footprint and explore opportunities for eco-friendly practices:

- **Functional Value:** Evaluates how the product or service reduces environmental impact through its functionality**.**
- **Supplies and Outsourcing:** Considers the environmental impact of the supply chain and procurement processes.
- **Materials:** Focuses on the types of materials used and their environmental footprint.
- **Production:** Assesses the environmental impact of manufacturing processes, including energy use and emissions.

- **Distribution:** Evaluates the logistics and transportation impacts of delivering products to customers.
- **Use Phase:** Considers how the product's use impacts the environment and identifies ways to minimize negative effects.
- **End-of-Life:** Examines how products are disposed of and explores options for recycling or repurposing.
- **Environmental Benefits:** Identifies positive environmental impacts, such as reducing carbon footprint or enhancing biodiversity.
- **Environmental Costs:** Assesses the costs associated with environmental impacts and sustainability initiatives.




### 3. Social Layer

The Social Layer is dedicated to understanding and enhancing the social impact of the business model. It includes components that address the company's role in society and its effects on various stakeholders:

- **Social Value:** The societal benefits provided by the product or service, such as health improvements or educational enhancements.
- **Governance:** The company's approach to ethical governance and transparency.
- **Social Stakeholders:** The groups or communities impacted by the business, including employees, customers, and local communities.
- **Employee Practices:** The company's policies and practices regarding employee well-being and rights.
- **Community:** The business's impact on and engagement with local communities.
- **Social Impact:** The broader social effects of the business, such as job creation or contributions to social equity.

- **End-User:** How the end-users experience the product or service in terms of social impact.
- **Social Costs:** The social expenses incurred by the business, including costs related to employee welfare and community investment.
- **Social Benefits:** The positive social outcomes generated by the business model, such as improved living conditions or increased access to services.


## Circular Canvas

Introduction to the Circular Canvas - Making sense of each Circular Canvas category - Circular Canvas learning platform

### Understanding the Circular Canvas

The Circular Canvas is a strategic tool designed to help businesses integrate the principles of the circular economy into their business models. Developed by Circulab, the Circular Canvas provides a structured framework for businesses to transition from linear (take-make-dispose) models to circular (regenerate and restore) systems. This approach emphasizes sustainability, resource efficiency, and long-term value creation by focusing on reducing waste, maximizing resource use, and creating positive environmental and social impacts.

The Circular Canvas is organized into several key areas, each focusing on different aspects of circularity within a business model. These areas collectively guide businesses to rethink how they create, deliver, and capture value in a sustainable manner.

- **The mission:** What mission is the company seeking to fulfill? What are the basic needs they are trying to fulfill? The mission is your red thread.

- **Key activities:** The Key Activities of your business are the actions that your business undertakes to achieve the value proposition for your customers. What are the key value creation activities? What skills are already available? Which ones should we acquire?

- **Partners:** This moves into the realm of, on top of my human resources, "who else will I need to rely on to deliver my value proposition?'.Who are the key partners, suppliers, and human resources you will need to create and deliver value? Which expertise do they provide? Which activity are they key for?

- **Resources:** These resources are what is needed practically to undertake the action/activities of your business: Natural, Technical, and Energy resources. When thinking of the resources your company uses, adopt a long-term perspective. How easy will it be for your company to source this particular raw material in 20 years? How is this going to impact your costs in the long run? Try to adopt a systemic approach when thinking of your resources – the razor your company commercializes certainly uses water in its production process.

- **Value proposition:** What problem are you trying to solve? What value are you bringing to each of your stakeholders? How would you describe the experience offered? A good way to approach this for B2C businesses is by looking at your customer segments, and defining where your product/service solves the problem for your customer, based on Maslow's Hierarchy of Needs. If instead, you are a B2B provider, then don't forget you are a key partner in the client-business ability to deliver their value proposition to their own customers.

- **Users and context:** For whom is the value being created? Who are the core target customers and/or end-users? Is your user the one making the final purchasing decision too? In which contexts is our offering solving those problems?

- **Next use:** This question is at the heart of what the circular economy embodies. What are the end-of-use scenarios for the product/service and each of its components/packaging? Can it meet new needs at the end of the use cycle? Can the product or its components be reused? Repaired? Recycled? How can you incentivize the user or partners to achieve a zero-waste objective?

- **Distribution:** How do we deliver the product/service to the end-users? How does the delivery process work? How can the offer be marketed? What is the level of customer service in place, and how could we develop it further?

- **Impact (Positive/Negative):** Once those categories are mapped out, consider the impact each of them has on your ecosystem – be it positive or negative, social or environmental impact. This part is really about brainstorming. The goal of mapping those impacts is to identify potential areas for improvement. We are looking at "How we could do less badly", but most importantly about "How we can do good?". Reducing negative impacts is important, but thinking about how to create positive externalities is even better. Remember that the impact can be indirect. Do not only consider how the extraction of this particular mineral resource releases GHG, think about the impact the increase in GHG will have on the ecosystem near your plant.

- **Profitability Analysis:** A business can only be viable if it has stable revenue streams, and can manage its costs so as to generate profits. Consider the inflows and outflows tied to each category of your business model, and how each iteration of your canvas may impact your cost structure. For instance, if you are looking to repurpose your coffee waste, can this generate an additional revenue stream? What will be the costs associated with such repurposing?### Implementation of the Circular Canvas.

The Circular Canvas is a comprehensive tool that guides businesses in transforming their models to embrace the principles of the circular economy. By systematically addressing each aspect of the business—from value proposition to end-of-life management—it helps companies reduce their environmental impact, enhance resource efficiency, and create lasting value for society and the economy. This approach not only supports sustainability but also drives innovation and long-term success in an increasingly eco-conscious marketplace.

## 3. Implementing a Sustainable Business Model Canvas (SBMC)

Implementing the Circular Canvas involves several steps, ensuring that businesses can effectively transition to or enhance their circular practices. Here's a detailed look at the process:

**Preparation and Assessment:**

- Begin with a thorough assessment of the current business model, focusing on identifying linear practices and their environmental and social impacts.
- Gather data on resource use, waste production, and supply chain operations.

**Stakeholder Engagement:**

- Engage key stakeholders, including employees, customers, suppliers, and community members, to gather diverse perspectives and insights.
- Encourage collaboration to identify opportunities for circular practices and innovations.

**Workshop and Brainstorming Sessions:**

- Conduct workshops and brainstorming sessions to explore how circular principles can be integrated into the business model.
- Use the Circular Canvas as a framework to map out changes and new strategies in each area.

**Design and Planning:**

- Develop detailed plans for implementing circular strategies, focusing on product design, resource sourcing, production processes, and end-of-life management.
- Identify necessary changes in partnerships, logistics, and customer engagement.

**Pilot and Test:**

- Implement pilot projects to test circular initiatives on a small scale, allowing for experimentation and learning.
- Gather feedback and refine the strategies based on real-world outcomes.

**Full-Scale Implementation:**

- Scale successful circular initiatives across the business, integrating them into standard operations.
- Continuously monitor and evaluate performance to ensure ongoing improvement and alignment with circular principles.

**Continuous Improvement:**

- Treat circularity as a dynamic process, continuously seeking new opportunities for improvement and innovation.
- Regularly review and update the Circular Canvas to reflect changes in the business environment and advancements in circular economy practices.

**What are the specific advantages of the methods?**

Implementing a SBMC is a comprehensive and dynamic process that requires careful planning, inclusive stakeholder engagement, and a commitment to continuous improvement. By following these steps and recommendations, businesses can effectively integrate sustainability into their core strategy, leading to long-term success and positive societal impact. This structured approach helps businesses navigate the complexities of sustainability and transform their models to create enduring value for all stakeholders.

As demand for resources is growing exponentially, companies need to redesign their model so as to better manage resource limits while pursuing economic growth. This brings us down to the concept of circularity, which follows “reduce, reuse, recycle, renew” as its guiding principles.

The Business Model Canvas is a great tool to analyze how companies create and capture value. Yet, it fails to account for the fact that this value-creation process is based on a company’s access to an entire ecological system.

With the SBMC, businesses can:

- Map your business models and its impacts
- Share information with stakeholders
- Create circular products/services.

This easy to complete canvas enables them to map in a straightforward and holistic way what their business is doing. As such, the SBMC can help entrepreneurs structure their discussions with potential impact investors, but also accompany existing businesses when engaging into partnerships with other organisations or explaining its business to potential clients.

## 4. Annexes as necessary/available:

Please provide any further useful information and materials:

- Presentations
- Templates related to the tool
- Existing case studies
- Literature
- Etc.

Sources:

- [Journal of Cleaner Production](https://www.sciencedirect.com/science/article/pii/S0959652618316543) - Academic paper on sustainable business model innovation.
- [Business Models for Sustainability](https://www.mdpi.com/journal/sustainability/special_issues/Business_Models) - Special issue on sustainability in business models.
- [Sustainable Business Network](https://sustainable.org.nz/sustainable-business-models/) - Practical examples and case studies on sustainable business models.
- [SBM Insights](https://sustainablebusinessmodel.org/) - Frameworks and tools for sustainable business model innovation.
- [Strategyzer](https://www.strategyzer.com/blog/posts/2017/3/15/sustainable-business-models) - Insights into integrating sustainability into business models.
- [Sustainable Business Model Innovation](https://journals.sagepub.com/doi/abs/10.1177/1086026619899428) - Academic perspective on sustainable business model innovation.
- [Cambridge University Press](https://www.cambridge.org/core/journals/journal-of-management-and-organization/article/abs/sustainable-business-model-innovation/ABDCI042B624E6A713C32EE683576F59) - Journal article on sustainable business model innovation.

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# D.1.4.3

# C2C guidance book
# Tool description
# Audit/Maturity assessment

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|---|---|
| **WP n°:** | **1** |
| **Task n°:** | **A1.4** |
| **Author(s):** | **PP2 TZ Horb** |
| **Contributors:** | **All partners** |
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Contents

# 1. Purpose of maturity assessment tools – what are they used for? For which results?

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.

The main purposes of using maturity assessment tools include:

- **Evaluate Current State:**
  - Identify the current level of performance or capability in a specific area.
  - Highlight strengths and areas for improvement.

- **Benchmarking:**
  - Compare the organization's maturity against industry standards or best practices.
  - Understand how the organization stands in comparison to peers or competitors.

- **Strategic Planning:**
  - Guide decision-making by providing insights into where investments or improvements are needed.
  - Help in setting realistic goals and milestones for growth and development.

- **Continuous Improvement:**
  - Track progress over time as changes and improvements are implemented.
  - Encourage a culture of ongoing development and enhancement.

# 2. Description

**Maturity Assessment Tools for the Circular Economy Paradigm**

There are several maturity assessment tools designed specifically to evaluate and support the adoption and implementation of circular economy (CE) principles within organizations. These tools help businesses assess how advanced they are in transitioning from a traditional linear economy (take-make-dispose) to a circular economy model (reduce-reuse-recycle). Here are some of the most recognized maturity assessment tools for the circular economy:

**Circular Transition Indicators (CTI) by the World Business Council for Sustainable Development (WBCSD)**

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| Description | The CTI tool provides a standardized approach for companies to measure and improve their circular performance. |
| Key Features | Focuses on key metrics related to material flows, circular strategies, and impacts. It helps businesses understand how circular their operations and products are. |
| Use | Provides a clear methodology for assessing and tracking circularity within an organization over time. |
| Link | https://www.wbcsd.org/Programs/Circular-Economy/Circular-transition-indicators/Resources/Circular-Transition-Indicators-v3.0 |

| **Maturity and Implementation Model (MIM) for Circular Economy** | |
|---|---|
| Description | Developed by the Ellen MacArthur Foundation, the MIM helps organizations map their progress in transitioning to a circular economy. |
| Key Features | Focuses on different stages of circular economy implementation, from initial awareness to advanced adoption. |
| Use | Provides a detailed roadmap and best practices for advancing circular economy initiatives within organizations. |
| Link | https://ellenmacarthurfoundation.org/ |

| **Circular Economy Assessment Tool (CEAT)** | |
|---|---|
| Description | Developed by the European Commission, CEAT helps businesses evaluate their circular economy practices. |
| Key Features | Assesses multiple dimensions such as circular supply chains, product lifecycle management, and end-of-life strategies. |
| Use | Offers a comprehensive assessment to identify strengths and areas for improvement in circular economy practices. |
| Link | https://ec.europa.eu/environment/strategy/circular-economy-action-plan_en |

**Maturity Assessment Tools for the Cradle to Cradle (C2C) Paradigm**

There are also several maturity assessment tools and certification systems available to support organizations in adopting and advancing within the C2C framework. These tools help assess

the current state of practices and guide the development of more sustainable, circular products and systems. Here are some of the most recognized maturity assessment tools for the Cradle2Cradle paradigm:

| **Cradle to Cradle Certified™ Product Standard**<br><br>Administered by The Cradle to Cradle Products Innovation Institute. | |
|---|---|
| Description | This is the leading global certification program for products designed for a circular economy. It evaluates products across five categories: Material Health, Material Reutilization, Renewable Energy and Carbon Management, Water Stewardship, and Social Fairness. |
| Key Features | Products can achieve Basic, Bronze, Silver, Gold, or Platinum levels based on their performance in the five categories |
| Use | The certification process helps companies assess their products' environmental and social impacts and provides a roadmap for continuous improvement towards higher levels of certification. |
| Link | https://www.c2ccertified.org/get-certified/product-certification |

| **C2C Framework & Maturity Model by EPEA** | |
|---|---|
| Description | The Environmental Protection Encouragement Agency (EPEA), co-founded by Michael Braungart, a co-creator of the C2C concept, offers a framework for organizations to implement and mature their C2C practices. |
| Key Features | This model helps organizations evaluate their processes and products based on C2C principles, focusing on safe materials, continuous reuse of materials, and the use of renewable energy. |
| Use | It provides a step-by-step approach for companies to understand where they stand in their C2C journey and how to advance. |
| Link | https://epea.com/cradle-to-cradle/ |

| **Cradle to Cradle Evaluation Matrix by Circular IQ** | |
|---|---|
| Description | Circular IQ offers a tool specifically designed to evaluate and improve circular economy practices, including those aligned with the C2C paradigm. |
| Key Features | This matrix assesses various aspects of product and process design, |

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| | material health, and reutilization against C2C principles. |
| Use | It helps organizations benchmark their current state and develop actionable strategies to enhance their C2C capabilities. |
| Link | https://www.circular-iq.com/ |

There are also many further tools available in the project regions either on the national or the local level.

There is no clear argument to prioritise one maturity assessment tool against the others in the framework of the Cradle-ALP project. The rationale for including them in the Cradle-ALP toolbox is that they provide a relatively easy way to initiate an interaction with companies and encourage them to engage into a circular transformation process. These tools offer structured methodologies for evaluating current practices, guiding improvements, and achieving higher levels of environmental and social responsibility.

## 3. Implementing maturity assessment tools

The implementation process of maturity assessment tools is very similar for all tools and can be summarised in the following steps:

- **Defining Scope and Objectives:** Determine which products, processes, or business areas will be assessed using the C2C maturity tools.
- **Selecting the Appropriate Tool:** Choose a tool or framework that best aligns with the organization's goals and the specific aspects of C2C principles they aim to evaluate and improve.
- **Data Collection and Analysis:** Gather relevant data on materials, processes, and product life cycles. Use the tool to assess performance against C2C criteria.
- **Assessing and Scoring:** Evaluate the collected data and assign maturity levels or certification statuses based on the tool's guidelines.
- **Identifying Gaps and Opportunities:** Analyze the results to pinpoint areas needing improvement or potential enhancements in circularity and sustainability.
- **Developing Action Plans:** Formulate strategies to advance maturity levels, focusing on product redesign, process improvements, and the integration of renewable resources.
- **Monitoring and Continuous Improvement:** Regularly review and reassess to track progress and refine strategies as the organization moves towards higher levels of C2C maturity.

On the operational level, there are two main ways to use a maturity assessment tool:

- **Self-assessment** by the companies, either internally or through an online questionnaire.
- Assessment performed by or with the support of an **external expert**.

In the context of the Cradle-ALP project, it is recommended that experts from the partnerships interact with business when performing such assessments, in order to be able to identify their specific needs and make recommendations in line with the objectives of the businesses and the project as well.

## 4. Annexes as necessary/available:

n.a.

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Alpine Space

Cradle-ALP

**Project Acronym: Cradle-Alp**

**Project number: ASP0100003**

# D.1.4.3

# C2C guidance book
# Tool description
# QuickScan

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|---|---|
| **WP n°:** | **1** |
| **Task n°:** | **A1.4** |
| **Author(s):** | **CCIAAPD** |
| **Contributors:** | |
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# 1. Purpose of the Tool

The Quickscan Circular Business Models tool is designed to provide organizations with a comprehensive analysis of their current business models in relation to sustainability and circularity. The tool is structured to deliver insights and recommendations across two primary phases: assessing the current position and developing or adapting the business model. It delivers insights and recommendations across two primary phases:

- **Current Business Model Assessment:** Evaluation of existing practices based on sustainability and circularity indicators using a Likert scale. Topics include product-as-a-service, recycling, value retention, and environmental compliance.

  → *10-20 Points:* Predominantly linear model with minimal sustainability elements.

  → *21-30 Points:* Emerging integration of circular practices.

  → *Above 30 Points:* Strong implementation of circularity.

- **Development of a Future-Oriented Circular Business Model:** Based on assessment outcomes, organizations are guided to:

  - Select a suitable business model
  - Identify appropriate R-strategies
  - Determine organizational form
  - Asses and develop supporting processes
  - Select aligned revenue models
  - Evaluate systemic impact

# 2. Description of the Tool and Its Main Elements

## 2.1 Current Position Assessment

This involves a structured evaluation of the company's current business model using a scoring tool. Statements are rated from 1 (not implemented) to 5 (fully implemented). Results are visualized in a radar plot, highlighting maturity across dimensions such as ambition, experience, circular practices, and priorities.

## 2.2 Business Model Selection

Companies choose from seven predefined types:

- **Resource Models:** Focus on material recovery (reuse, remanufacturing, recycling)
- **Design Models:** Emphasize modularity, disassembly, and eco-design

- **Lifetime Extension Models:** Extend use phase through maintenance, repair, refurbishment
- **Platform Models:** Enable shared access through digital platforms
- **Product-as-a-Service Models (PAAS):** Deliver functions via services instead of ownership
- **End-of-Life Models:** Implement take-back, tracking, and responsible disposal
- **Lifecycle Models:** Integrate circularity across all phases of a product's lifecycle

### 2.3 R-Strategies

Strategic framework guiding circular actions. They include:

- Refuse, Rethink, Reuse, Repair
- Refurbish, Remanufacture, Repurpose, Recycle, Recover

### 2.4 Organizational Form

Ranges from classical linear companies to complex looped systems involving supply chain collaboration and shared ownership. They include:

- Classical organization
- Value chain
- Looped system

### 2.5 Supporting Processes

Critical enablers for circular transition include:

- Return logistics
- Technical infrastructure
- Setting up production systems
- Digital platforms (material mediation, tracking)
- Competence development
- Quality monitoring

### 2.6 Revenue Models

The tool considers both traditional and circular-compatible models:

- Subscriptions, deposits, compensations
- Use of recyclates/ waste streams
- Product on demand, data as a service, smart pricing
- Buy-back schemes, extended warranties, lease

### 2.7 Impact Assessment

Assesses the effects of the proposed model:

- Risk reduction
- Resource security
- Material efficiency
- CO2 and emissions reduction
- Job creation and restoration potential

## 3. Implementing the Tool

**Phase 1: Assessment**

- Use the questionnaire to evaluate the current model
- Score responses and generate a radar plot
- Interpret positioning within defined score bands

**Phase 2: Model Development**

- Choose business model type based on ambition and context
- Select corresponding R-strategies
- Determine suitable organizational form
- Assess and strengthen supporting processes
- Match with suitable revenue model(s)
- Evaluate the model's projected sustainability and resilience impact

## 4. Explanation of the features

### 4.1 Basic Type Business

#### 4.1.1 Resource Models

Resource Models focus on the recovery and efficient use of materials at the end of their lifecycle. This includes processes such as dismantling, reusing, remanufacturing, and recycling. The primary aim is to minimize waste by keeping materials in use for as long as possible. These models involve setting up logistics for returning used materials, ensuring quality through technical infrastructure, and often involve new revenue streams through the sale of recycled materials.

#### 4.1.2 Design Models

Design Models are centered on creating products that inherently support circularity. This involves designing products for longevity, ease of repair, and eventual recycling. Key strategies include modular design, use of sustainable materials, and designing for disassembly. The goal is to create products that retain their value over time and are easy to maintain, refurbish, and recycle, thereby reducing environmental impact.

#### 4.1.3 Lifetime Extension Models

Lifetime Extension Models aim to extend the usability of products through regular maintenance, repair, refurbishment, and remanufacturing. By focusing on prolonging the life of products and their components, these models help in reducing the demand for new resources and minimizing waste. Services such as maintenance and inspection, buy-back programs, and refurbishment are integral to these models, providing ongoing value to both the business and the customer.

#### 4.1.4 End-of-life Models

End-of-Life Models deal with the processes involved in managing products at the end of their lifecycle. This includes take-back schemes, recycling, and proper disposal to ensure minimal environmental impact. These models often incorporate digital tools for tracking products throughout their lifecycle, enabling efficient recovery and recycling of materials. The goal is to close the loop by ensuring that products are either reused, remanufactured, or recycled back into new products, thus supporting a circular economy.

### 4.2 R-strategies

#### 4.2.1 Rethink

Rethink involves fundamentally changing the way products are designed and produced to enhance sustainability and circularity. It emphasizes innovative approaches that prioritize environmental impact from the outset, such as modular design, using sustainable materials, and creating products that are easy to repair and recycle.

#### 4.2.2 Reduce

Reduce focuses on minimizing the use of raw materials and energy throughout the product lifecycle. This strategy aims to lower the environmental footprint by optimizing production processes, reducing waste, and using fewer resources without compromising product quality or functionality.

#### 4.2.3 Repurpose

Repurpose involves finding new uses for products or their components that have reached the end of their initial lifecycle. Instead of discarding them, this strategy seeks to extend their usability by

modifying or adapting them for different applications, thereby conserving resources and reducing waste.

#### 4.2.4 Recycle

Recycle is the process of converting waste materials into new products, thereby preventing the waste of potentially useful materials. This strategy aims to reduce the consumption of fresh raw materials, decrease energy usage, lower greenhouse gas emissions, and minimize water and air pollution by processing waste into reusable materials.

### 4.3 Organization Form

Value Chain refers to the full range of activities and processes that a company undertakes to deliver a product or service to the market, from initial conception to final delivery and beyond. In a circular economy context, the value chain is designed to maximize the reuse, recycling, and efficient management of resources. This involves:

**1. Sustainable Sourcing:** Procuring raw materials sustainably.

**2. Eco-friendly Design:** Designing products for durability and recyclability.

**3. Efficient Production:** Minimizing waste during manufacturing.

**4. Logistics:** Efficiently managing the transportation and distribution.

**5. End-of-Life Management:** Facilitating the return, recycling, or repurposing of products.

By integrating circular principles throughout the value chain, companies can reduce environmental impact, improve resource efficiency, and create new value opportunities.

### 4.4 Supporting processes

#### 4.4.1 Return Logistics

Return logistics involves the efficient management of the reverse flow of products from consumers back to manufacturers for reuse, refurbishment, or recycling. This process ensures that products and materials are recovered and re-enter the production cycle, reducing waste and conserving resources.

#### 4.4.2 Competences

Competences refer to the skills and expertise required to implement and manage circular business models effectively. This includes knowledge of sustainable practices, technical skills for repairing and refurbishing products, and the ability to innovate and adapt to new circular strategies.

#### 4.4.3 Technical Infrastructure

Technical infrastructure encompasses the tools, technologies, and systems necessary to support circular processes. This includes machinery for recycling and remanufacturing, digital platforms for tracking product life cycles, and software for managing logistics and inventory.

#### 4.4.4 Setting up (production) Processes

This involves designing and implementing production processes that align with circular economy principles. It includes optimizing manufacturing techniques to minimize waste, using renewable energy sources, and integrating eco-friendly materials into production lines.

#### 4.4.5 Material Mediation Platform

A material mediation platform facilitates the exchange and management of materials within a circular economy. It connects suppliers, manufacturers, and recyclers to ensure that materials are efficiently used, reused, and recycled, promoting resource efficiency and reducing environmental impact.

#### 4.4.6 Quality Monitoring

Quality monitoring ensures that products and materials maintain high standards throughout their life cycles. This involves regular inspections, testing, and validation to ensure that reused and refurbished items meet the required quality and safety standards, thereby enhancing customer trust and product longevity.

### 4.5 Revenue Models

#### 4.5.1 Compensation (ETS, Tree Planting)

This model involves receiving compensation through mechanisms like Emissions Trading Systems (ETS) or environmental initiatives such as tree planting. Companies can earn credits or incentives for reducing emissions or contributing to environmental conservation.

#### 4.5.2 Cross-selling

Cross-selling refers to offering related or complementary products to existing customers, enhancing revenue by meeting additional needs and increasing customer value.

#### 4.5.3 Warranty

Offering warranties provides customers with assurance regarding product longevity and reliability. This can be a revenue model by including premium warranty services for extended coverage and repairs.

#### 4.5.4 Use of Waste Streams

This model generates revenue by repurposing waste materials from production processes into new products or selling them to other industries that can use them as raw materials.

#### 4.5.5 Use Recyclates

Revenue is generated by incorporating recycled materials into new products, often reducing costs and appealing to environmentally conscious consumers.

#### 4.5.6 Produce on Demand

Produce on demand involves manufacturing products only when there is an order, minimizing overproduction and inventory costs while tailoring production to actual market needs.

#### 4.5.7 Sell

The traditional model of generating revenue by selling products directly to consumers or businesses, focusing on volume and market reach.

#### 4.5.8 Offsetting Based on Raw Material Consumption

This model involves offsetting the environmental impact of raw material consumption by investing in sustainability projects or purchasing offsets, allowing companies to balance their ecological footprint.

#### 4.5.9 Extended Lifespan

Revenue is generated through services that extend the lifespan of products, such as maintenance, refurbishment, and upgrades, encouraging longer use and customer loyalty.