

Blickpunkt Forschung Kreislaufwirtschaft

- **Circular Start into Business**
- **Circular Economy Tools Verpackung**

Dr. Rainer Pamminger

06.10.2021

Blickpunkt Forschung Kreislaufwirtschaft

- **Circular Start into Business**
- **Circular Economy Tools Verpackung**

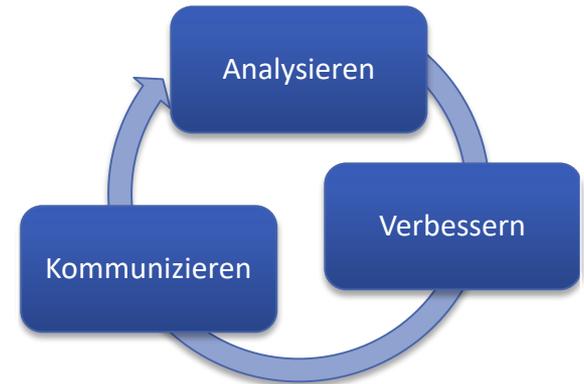
Dr. Rainer Pamminger

06.10.2021

Vorstellung

Unsere Themenfelder:

- Life Cycle Assessment (LCA/PCF)
- Umweltgerechte/kreislaufgerechte Produktentwicklung
- Geschäftsmodelle für eine KLV
- Produkt-Umweltkommunikation (EPD)



TU Wien, Forschungsgruppe ECODESIGN

- Methodenentwicklung
- F&E mit Industrie
- Wissensvermittlung



www.ecodesign.at

ECODESIGN company - TU Spin-off

- Umsetzung mit Unternehmen
- Trainings



www.ecodesign-company.com

Ausgewählte Referenzen



PHILIPS



Sony DADC



LEDON



SIEMENS



BOMBARDIER



LIEBHERR



ENGEL



METEKA
gives germs no chance



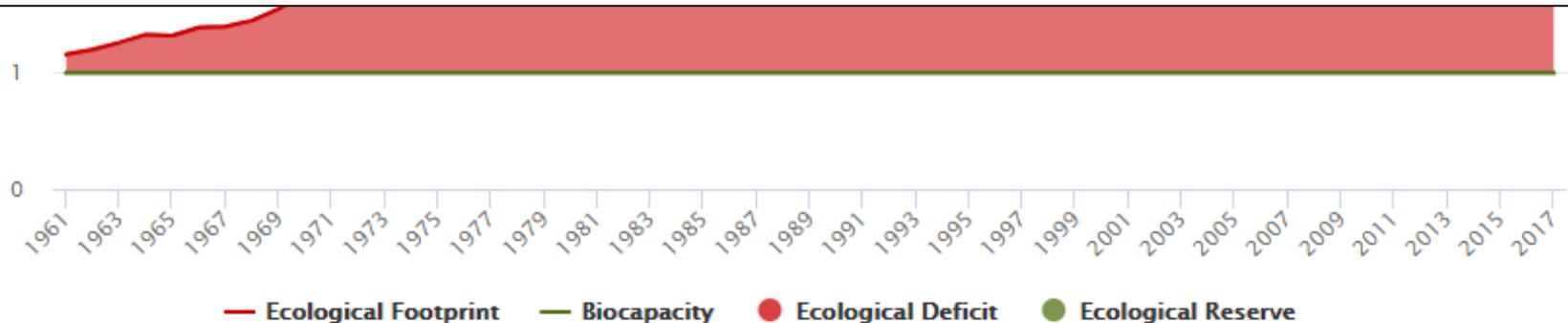
GRASPOINTNER
Nachhaltig innovativ.

Österreichischer Footprint

4 Erden zur
Deckung unseres
Bedarf

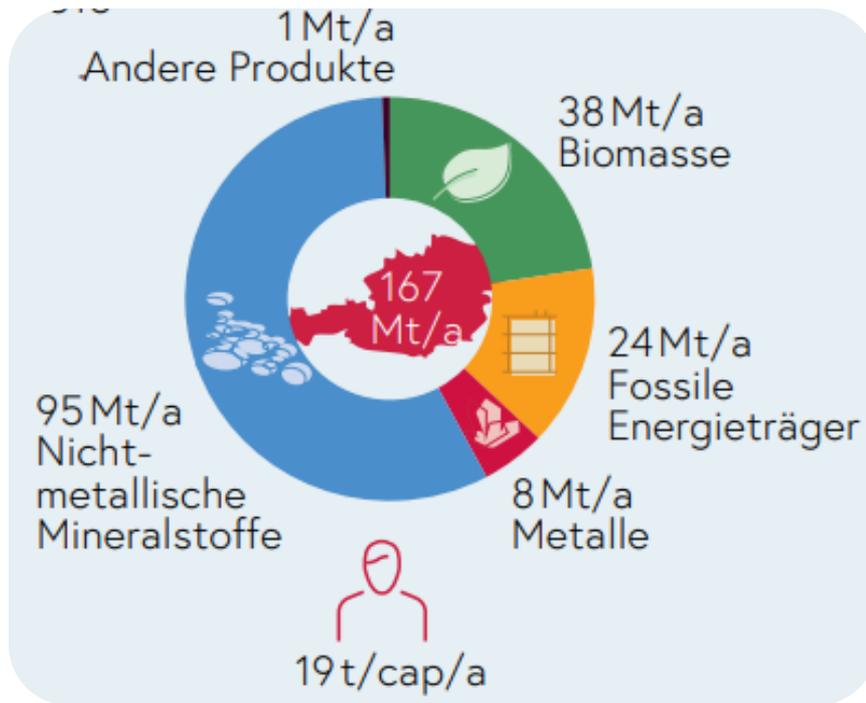
Home > Aktuelles

7. April – Welterschöpfungstag / Earth Overshoot Day 2021 in Österreich



Global Footprint Network, 2021 National Footprint and Biocapacity Accounts

Ressourcenverbrauch in Österreich pro Kopf (2018)



EU-Durchschnitt: 14 t pro Jahr

Österreich: 19 t pro Jahr → 36%
über EU Durchschnitt

Definition Kreislaufwirtschaft

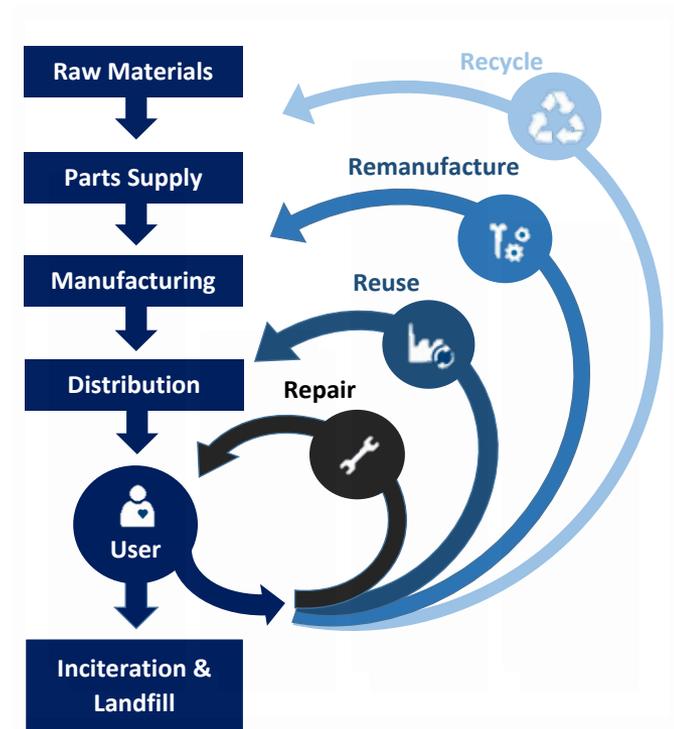
Von der Abfallwirtschaft zu den „inneren Kreisläufen“



Unter der Kreislaufwirtschaft versteht man die **Wiederverwendung, Reparatur, Wiederaufbereitung** und das **Recycling** bestehender Materialien und **Produkte**.

Was bisher als **Abfall** gewertet wurde, soll künftig als **Ressource** verwendet werden. Alle Ressourcen müssen künftig effizienter im Verlauf ihrer Lebensdauer genutzt werden.

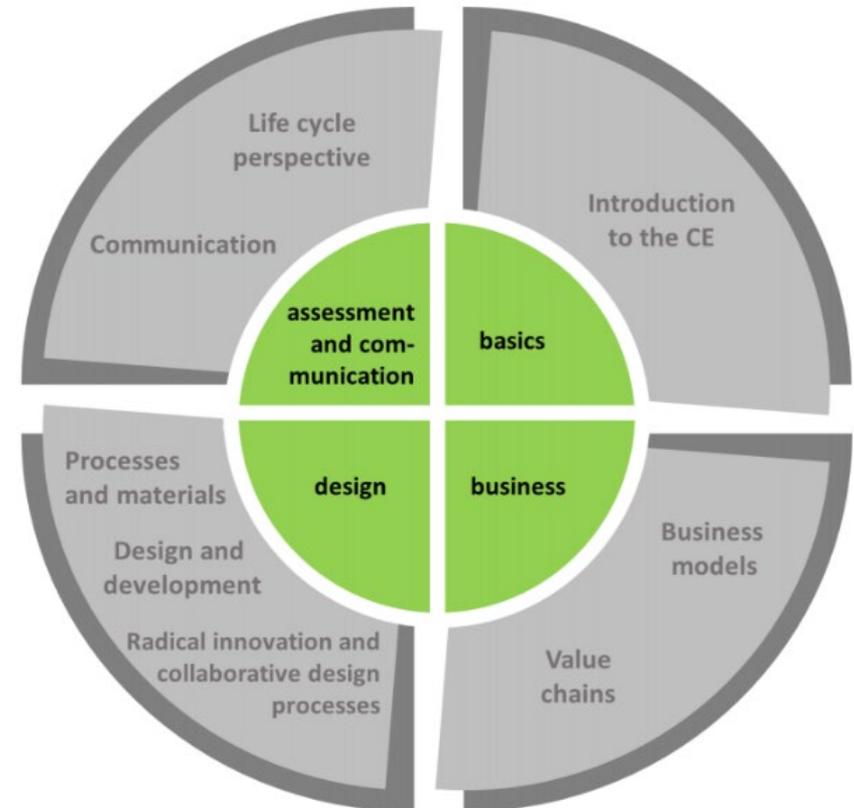
Europäische Kommission, 2014



Ziel: Lehrunterlagen zur Entwicklung von nachhaltigen Produkt-Dienstleistungen für eine **Kreislaufwirtschaft in der Bau- und Möbelbranche**

Ergebnisse:

- 8 inhaltliche Module
- 3 Tools
 - CE Analyst – Potentialerhebung
 - CE Strategist – Geschäftsmodell Strategien
 - CE Designer – Design Strategien



www.katche.eu

Lehrmaterialien inkl. Toolentwicklung

ERASMUS+ Projekt KATCH_e

Entwicklung eines Webtoolpakets zur Integration von CE-Prinzipien:

CE Strategist

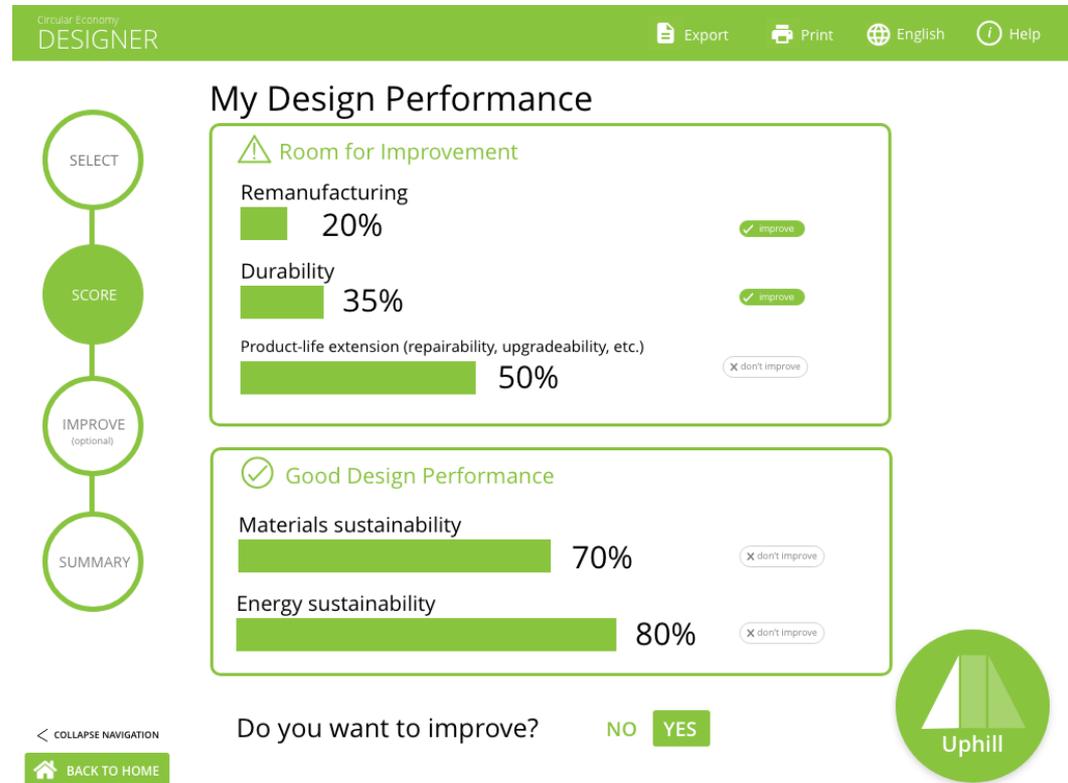
Welche CE-Strategie ist relevant und wie muss das Geschäftsmodell angepasst werden?

CE Designer

Wie kann das Produkt möglichst kreislauffähig gestaltet werden?

CE Analyst

Welche Umweltvorteile können daraus abgeleitet werden?



Online verfügbar: www.tools.katche.eu



Co-funded by the
Erasmus+ Programme
of the European Union

Forschungsprojekt: Ponto Verde

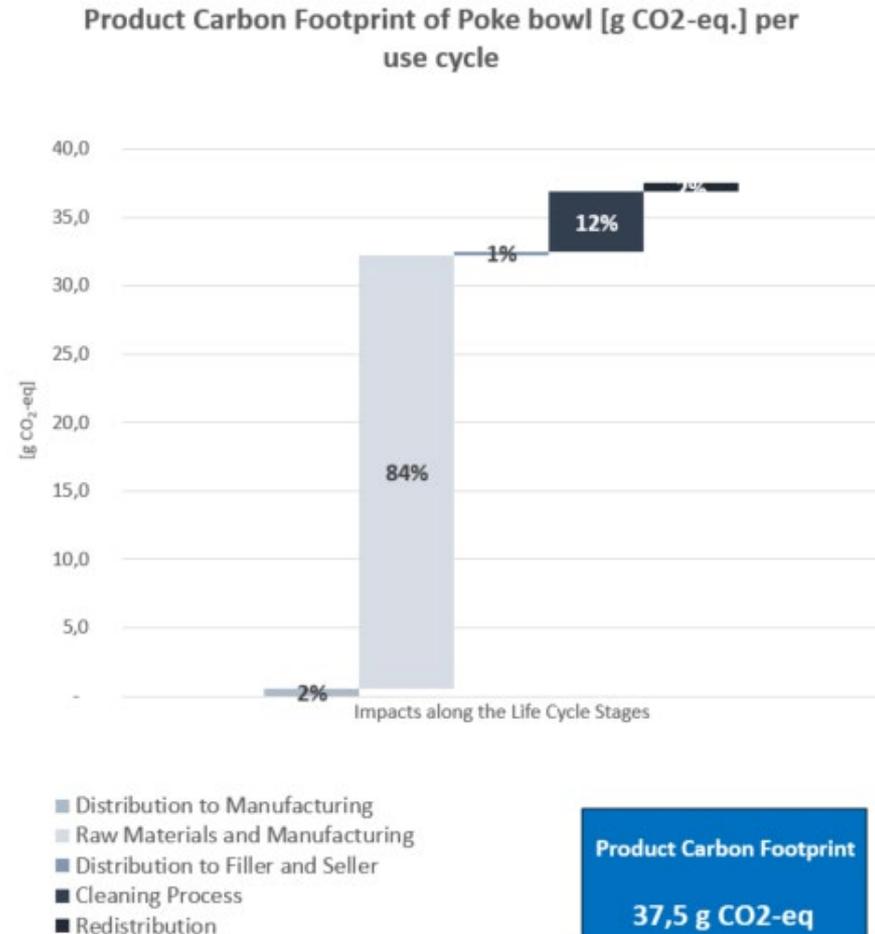
Ziel: Toolentwicklung für die Verpackungsbranche

Zielgruppe: Inverkehrbringer von Verpackungen (v.a. Getränke, Kosmetika, Reinigungsmittel)

Ergebnisse:

- **CE Analyst – Umweltbewertungstool** mit 3 Indikatoren (CO₂-Fußabdruck, Ressourceneffizienz, Littering-Risiko)
- **CE-Strategist** - Tool zur Integration von **Geschäftsmodellstrategien**
- **CE Designer** - Tool zur **Analyse des Produktdesigns** hinsichtlich CE-Eignung

CE Analyst for packaging

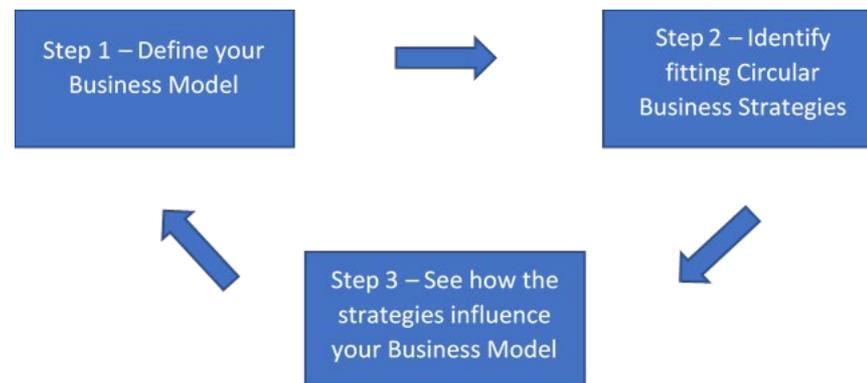


CE Strategist for packaging

Hilft Herstellern von FMCG (wie Nahrungsmitteln und Getränken) bei der

- **Auswahl der passenden Kreislaufstrategie** zur Umsetzung bei Verpackungen
- **Integration dieser Kreislaufstrategie im Geschäftsmodell**

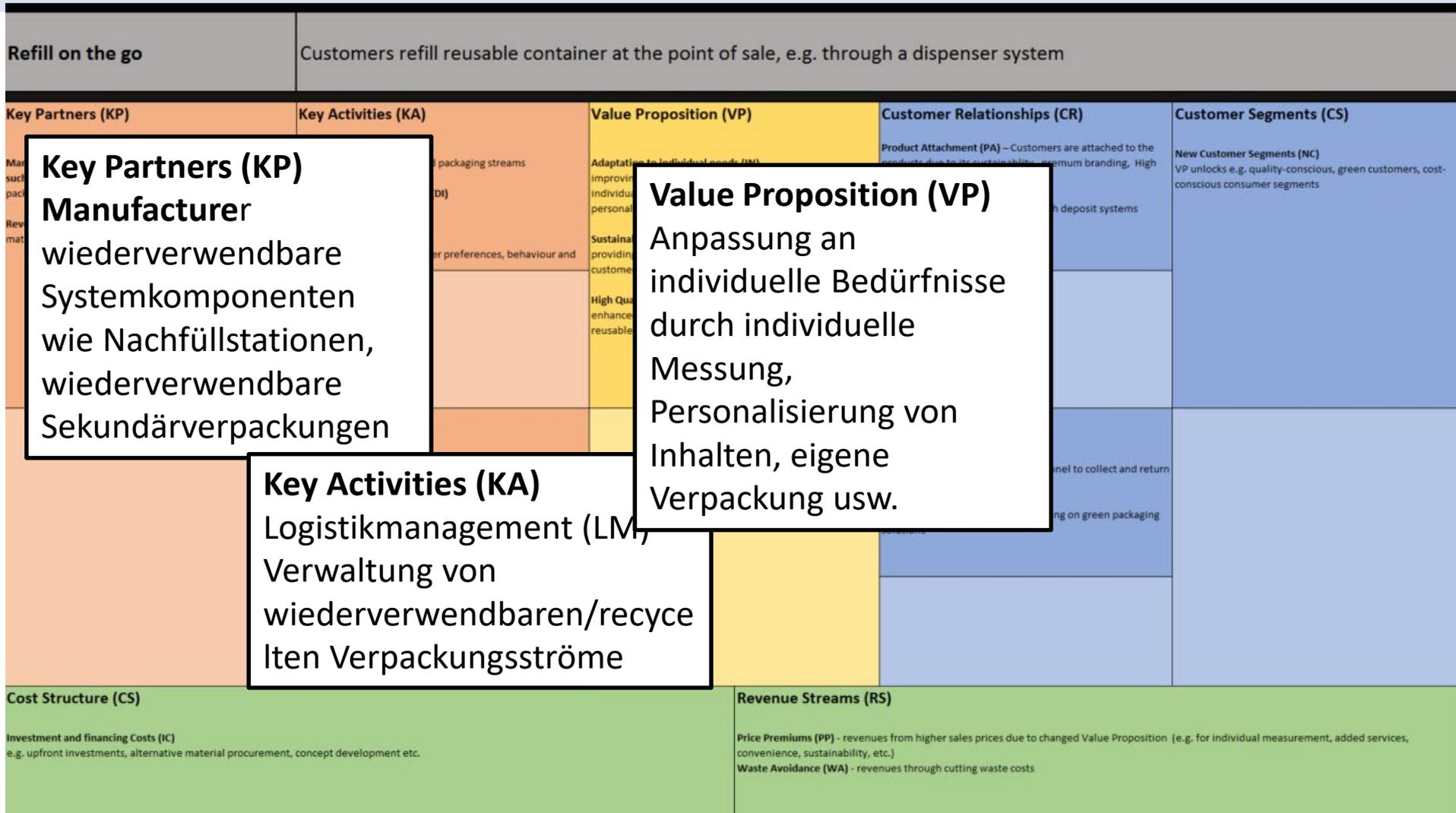
Tool baut auf weit verbreitetem **Business Model Canvas** auf und bietet vorgefertigte BMC-Templates für verschiedene CE-Strategien, die mögliche Veränderungen des Geschäftsmodells aufzeigen.



Auswahl der Kreislaufstrategie

Check the ones you want to follow up	Click on the Business Strategy to define the Business Model	Definition	Examples
<input type="checkbox"/>	<u>Rethink</u>	Packaging free or revised product design which uses less packaging	Soda Stream
<input type="checkbox"/>	<u>Reduce</u>	Revised packaging design using less materials	
<input type="checkbox"/>	<u>Refill at home</u>	Customers refill reusable container at home (e.g. with concentrates)	Splosh
<input type="checkbox"/>	<u>Refill on the go</u>	Customers refill reusable container at the point of sale, e.g. through a dispenser system	MIWA
<input type="checkbox"/>	<u>Return from home</u>	Reusable packaging is picked up from customers home (e.g. within a subscription service)	Adamah
<input checked="" type="checkbox"/>	<u>Return on the go</u>	Customers return packaging at the point of sale (e.g. deposit return machine)	Deposit bottles
<input type="checkbox"/>	<u>Recycle</u>	In-house recycling of materials	Lush
<input type="checkbox"/>	<u>Renew</u>	Substitute finite packaging materials with biobased and/or biodegradable materials	

Wie beeinflusst die Kreislaufstrategie Ihr Geschäftsmodell?



CE Designer for Packaging

... ein Checklisten-basiertes Tool zur **Priorisierung, Bewertung und Verbesserung** der Kreislauffähigkeit von Verpackungen

Assess Product or Service

In this step, the user should analyse the product or service according to the objectives of the project through the selected strategies.

In the evaluation, the user should start by identifying the relative importance of each criterion. For this selection, the user should have in mind the objectives for the project. Some criteria can be important as an objective for the project even if in the reference product the criterion had not been implemented.

The next step is the rating of the fulfilment. Here, the user has to evaluate each criterion. The weighted sum of the performance of all criteria will result in the final score/performance.

Design of long-life products

Design for materials sustainability

Resource efficiency means using the Earth's limited resources in a sustainable way, more with less and to deliver greater value with less input. A reduction of the implementing efficient strategies in product and service design. The selection of strategies has a positive influence on the product or service systems.

Applied Strategies

FULFILMENT IN PERCENT

DETAILS

Design of long-life products	 60%	▼
Design for product-life extension	 72%	▼
Design of product-oriented services	 36%	▼
Design of use- or result-oriented services	 43%	▼
Design for recycling	 69%	▲

Assess the strategy according with the following criterion:

Optimize products' design (shape, size, weight, etc.) to reduce material consumption

The design solutions of the product influence the consumption of materials

RELATIVE IMPORTANCE

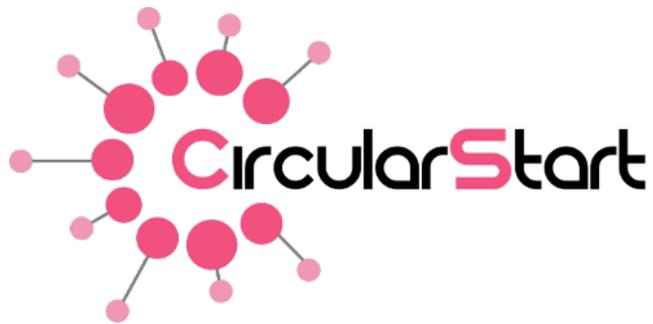


FULFILMENT

Select an option

B Actual size/shape allows exploring opportunities of resource reduction

JUSTIFICATION



CircularStart into Business



Co-funded by the
Erasmus+ Programme
of the European Union



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Ziel: Unterstützung von Start-ups zur Integration von Nachhaltigkeit und Kreislaufwirtschaft in ihre Geschäftsmodellentwicklung

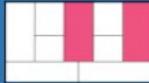
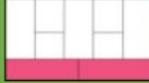
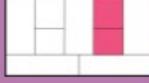
Ergebnis:

- **Online-Kurs** (Präsentationen, Videos, Übungen, Quizzes)
- **Guidance-Tool** zur Step by step Unterstützung bei der Integration von Kreislaufaspekten in neue Geschäftsmodelle,
- zusätzlichen Ressourcen (CS-Bewertungstool, CS-BMC, Trainerhandbuch)

Structure – “CE Readiness Levels”



TECHNOLOGY READINESS LEVELS (TRLs)	MARKET READINESS LEVELS (MRLs)	CIRCULAR ECONOMY READINESS LEVELS (CERLS)
0 Idea	Hunch	Understand circularity
1 Basic Research	Basic Research	Relate to circularity
2 Technology Formulation	Needs Formulation	Analyse existing circular solutions
3 Needs Validation	Needs Validation	Define a Circular Value Proposition
4 Small Scale Prototype	Small Scale Stakeholder Campaign	Analyse the circularity of your value chain
5 Large Scale Prototype	Large Scale Early Adopter Campaign	Specify the circular value chain
6 Prototype System	Proof of Traction	Analyse the Circularity Performance
7 Demonstration System	Proof of Satisfaction	Improve and Validate the Circularity Performance
8 First of a kind commercial system	Proof of Scalability	Communicate Circularity
9 Full commercial application	Proof of Stability	Maintain Circularity

CERL	BMC FOCUS	COURSE MODULE
0 Understand circularity		Ideation go to the course
1 Relate to circularity		
2 Analyse existing circular solutions		
3 Define a Circular Value Proposition		
4 Analyse the circularity of your value chain		Integration go to the course
5 Specify the circular value chain		
6 Analyse the Circularity Performance		Validation go to the course
7 Improve and Validate the Circularity Performance		
8 Communicate Circularity		Implementation go to the course
9 Maintain Circularity		

CERL	
0	Understand circularity
1	Relate to circularity
2	Analyse existing circular solutions
3	Define a Circular Value Proposition
4	Analyse the circularity of your value chain
5	Specify the circular value chain
6	Analyse the Circularity Performance
7	Improve and Validate the Circularity Performance
8	Communicate Circularity
9	Maintain Circularity

GUIDING QUESTIONS

*Which Sustainable Development Goals exist and which are important to us?
What is a Circular Economy and why do we need it?
What are the drivers and enablers of a Circular Economy?*

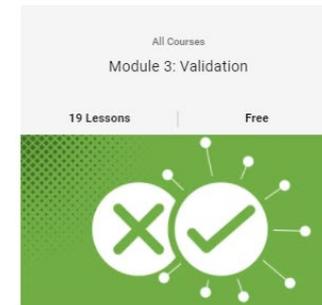
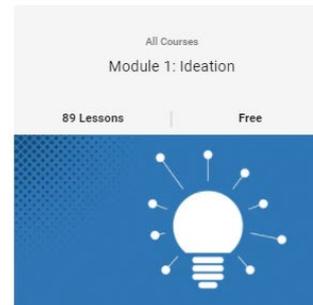
*How could the Circular Economy relate to my idea?
What are the most important SDGs in relation to my idea?
What environmental and social issues can be affected by our future business?
What products / services /systems are most important to be made circular?*

*Which business strategies of circularity exist?
What can I learn from other businesses? How do they achieve circularity?
What specific objectives can I define to integrate circularity?*

*What value is created for other stakeholders than our customers?
How do customers use our product / service? What happens at the end of life? Do they need to own the product?*

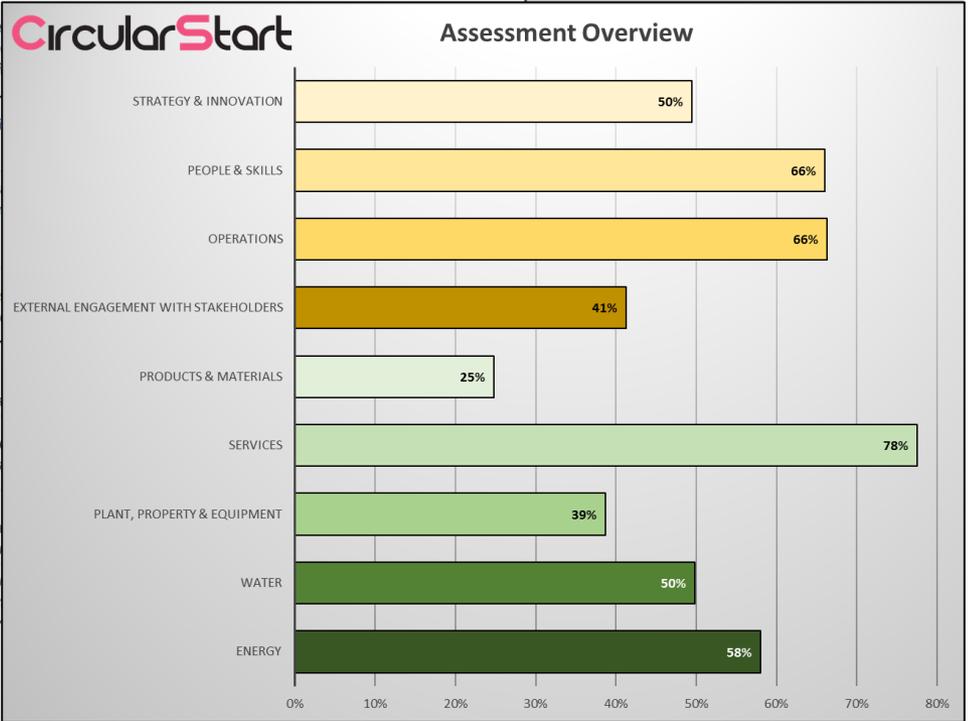
CERL	GUIDING QUESTIONS	RELATED UNITS
0 Understand circularity	<i>Which Sustainable Development Goals (SDGs) exist? What is a Circular Economy and why do we need it? What are the drivers and enablers of a Circular Economy?</i>	Unit 1 Unit 2 Unit 3
1 Relate to circularity	<i>How do Circular Economy and SDGs relate to your idea? Other than economic value, does your activity also create environmental and societal value?</i>	
2 Analyse existing circular solutions	<i>What kind of circular business models and strategies can be distinguished? What are the economic opportunities and financial implications? How can the circularity and sustainability of business models be analysed and measured?</i>	Unit 4 Unit 5 Unit 6
3 Define a Circular Value Proposition	<i>How are you able to provide circularity to your customer segments? How can you design a Value Proposition, which includes strategies which narrow, slow, close and/or regenerate resource flows?</i>	Unit 7 Unit 8
4 Analyse the circularity of your value chain	<i>What is a circular value chain and how can it be assessed? With which strategies can a circular value chain be achieved? What are the key activities making your value chain circular? What role could reverse logistics play in your value chain?</i>	Unit 1 Unit 2 Unit 3 Unit 4 Unit 5
5 Specify the circular value chain	<i>How can you identify, prioritize and integrate additional stakeholders needed in order to make your value chain circular?</i>	Unit 6 Unit 7
6 Analyse the Circularity Performance	<i>How can you identify relevant circularity and sustainability indicators? How can you use the CircularStart Assessment Tool to measure circularity?</i>	Unit 1 Unit 2
7 Improve and Validate the Circularity Performance	<i>How can you continually improve and validate the circularity and sustainability performance?</i>	Unit 3
8 Communicate Circularity	<i>What are the benefits of communicating circularity? How can you best communicate your circular approach to customers? Which tools and standards exist for communication?</i>	Unit 1 Unit 2
9 Maintain Circularity	<i>How can you maintain, monitor and improve the circularity efforts over time?</i>	Unit 3 Unit 4

- Zugang: kostenlos nach Anmeldung
- Zielgruppe: Start-ups und Inkubatoren
- Lehrmethode: Selbständiges Lernen oder Nutzung durch Inkubatoren nach Bedarf
- Umfang: 4 Module (insgesamt ca. 250 Lektionen)



learn.circularstart.eu

Enablers / Outcomes	Assessment Category	No.	Topic	Assessment Question	Answer
Enablers	<p>Strategy & Innovation</p>	1.1	Mission / Vision / Values	To what extent is CE relevant in your values/mission/vision?	2 - somewhat relevant (I am starting to consider it)
		1.2	CE related opportunities	Have you identified Circular Economy-related opportunities to attract new customers, enter new, unexploited markets and strengthen your value proposition?	2 - CE delivers some opportunities;
		1.3	Measurable CE targets	Do you have measurable CE targets for your business idea? <i>E.g. Key Resources: Raise the share of renewable materials for my product up to 100 % within the next 2 years. Customer relationships: Establish a take back system till the end of next year.</i>	3 - We have some specific quantitative targets
		1.4	Innovative solutions	To what extent are you offering innovative solutions? <i>You may consider: design of products to be repaired, upgraded, or reused; design of products to use renewable sources or that are recyclable.</i>	
	<p>People & Skills</p>	2.1	CE competences of staff	Do you have competences in CE?	
		2.2	Human well being/ fundamental needs	To what extent does your value proposition address human well being, protection, participation, and inclusion of customers?	
		2.3	Local jobs/wealth	To what extent will your business create local jobs and wealth? <i>E.g. creation of new jobs, e.g. in the repair and maintenance sector.</i>	
	<p>Operations</p>	3.1	IT and digital systems to support CE	To what extent are suitable digital systems in place to support CE? <i>e.g. platforms, waste or asset management systems.</i>	
		3.2	Processes to support CE	To what extent are processes in place to support CE? <i>e.g. manufacturing process, procurement, distribution, etc.</i>	
		3.3	Plant, property and equipment assets	To what extent are suitable assets in place to support CE? <i>e.g. reverse logistics infrastructure, repair and maintenance facilities, etc.</i>	
		3.4	Regeneration of ecosystems	To what extent does your value proposition address environmental regeneration and conservation of biodiversity? <i>e.g. fostering humus building, soil conservation, etc.</i>	





Guidance Tool -

<http://www.circularstart.eu/guidance-tool/>

E-learning Module und Inhalte -

<https://learn.circularstart.eu/>

Ankündigung: FFG Qualifizierungsseminar circular_design_BAU



- **Thema:** Kreislaufoptimierung von Baukomponenten und Geschäftsmodellen
- **Zielgruppe:** produzierende Unternehmen im Baubereich
- **Schulungsumfang:** 40 Stunden
- mind. 3 KMU im Konsortium, max. 8 Unternehmen
- 1.500 € Qualifizierungsprämie
- **Methode:** Interaktives Training für Unternehmen, Exkursion, ExpertInnenvorträge, Workshops
- **Fünf inhaltliche Module:**
 - Kreislaufwirtschaft
 - Methoden der Umweltbewertung
 - Kreislauforientierte Produktentwicklung
 - Kreislauforientierte Geschäftsmodelle
 - Umweltkommunikation
- **Interessierte Unternehmen bitte melden:**
Rainer.pamminger@tuwien.ac.at

Kontakt

Dr. Rainer Pamminger

E-Mail: rainer.pamminger@tuwien.ac.at

Web: www.ecodesign.at

Tel: +43 (0)1 588 01 307 - 53 / Mob: +43 (0)664 60 588 3078