



Circular Economy
Initiative
Deutschland

Circular Business Models: Overcoming Barriers – Unleashing Potentials

1 February 2022, World Circular Economy Forum (WCEF)



#closetheLoop #CEID



www.circular-economy-initiative.de

1 February 2022 09:00 – 10:30 AM

AGENDA



Circular Economy
Initiative
Deutschland

Susanne Kadner

Welcome

Erik Hansen

**Introduction to the Report
„Circular Business Models“**

Christian Schiller

Panel Discussion

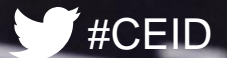
Erik Hansen

Patrick Wiedemann

Stephen Jamieson

Susanne Kadner

Summary and Outlook



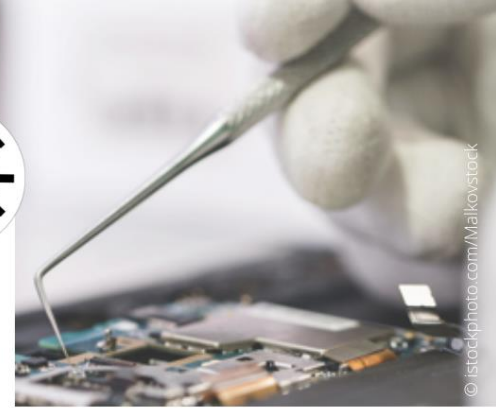
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Welcome!



From Ambition to Action!

Circular Business Models: Overcoming Barriers – Unleashing Potentials



 **Feb. 1st, 2022**  **09:00-10:30 AM (UTC+1)**  **Online Event**



Christian Schiller
Co-Founder & CEO -
cirplus GmbH



Prof. Dr. Erik G. Hansen
Head of the Institute for
Integrated Quality Design -
Johannes Kepler University Linz



Patrick Wiedemann
Group CEO -
Reverse Logistics GmbH



Stephen Jamieson
Global Head for
Circular Economy Solutions -
SAP SE

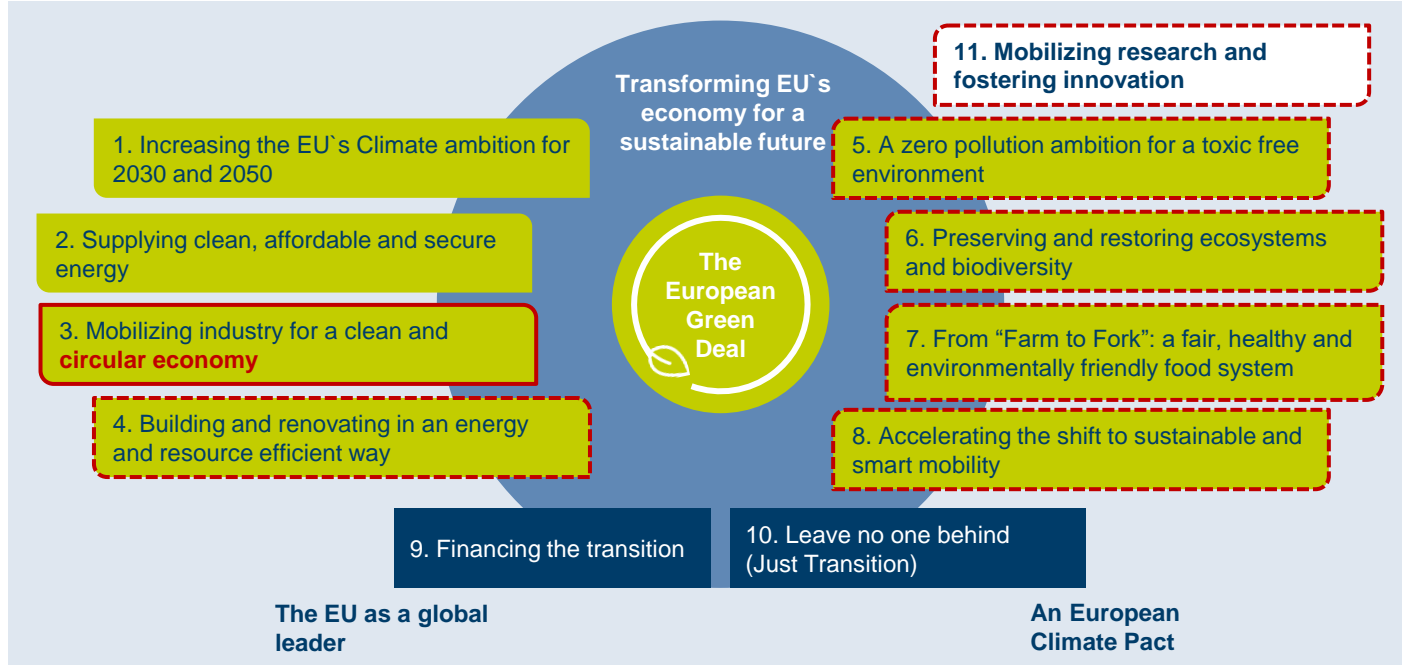


In the European Green Deal, the Circular Economy plays a central role in achieving the goal of greenhouse gas neutrality by 2050



Overview of the European Green Deal (EGD)

Remarks



- "The old growth model based on fossil fuels and pollution has outlived its purpose. What is needed now is a **strategy for growth that gives back more than it takes. The European Green Deal is our new growth strategy**" - Ursula von der Leyen (EU Commission President)
- The circular economy plays a central role in **achieving the goal of greenhouse gas neutrality by 2050**

Source EGD: European Commission

 CE in focus  CE as enabler

Overview CEID: 3 ministries, 24 companies, 24 scientific institutions and other relevant organizations from civil society



Politics

Federal Ministry of Education and Research

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Federal Ministry for Economic Affairs and Energy

Office

acatech
NATIONAL ACADEMY OF SCIENCE AND ENGINEERING

SYSTEMIQ

Business

ALPLA

BOREALIS
Keep Discovering

DAIMLER CLARIANT

AfB
social & greenIT

ACCUMOTIVE
Ein Unternehmen der Daimler AG

FIWARE
Open APIs for Open Minds

cirplus

Henkel

Hochland

interseroh
zero waste solutions

SCHWARZ

covestro

TRUMPF

PEM MOTION

BMW

Siemens

RLG
REVERSE LOGISTICS GROUP

pacoon
strategie + design

Stiftung GRS Batterien

RECENSO
Recycling and Energy Solutions

SAP

SIEGWERK

umicore

Academia

Fraunhofer ICT

Fraunhofer UMSICHT

Technische Universität Braunschweig

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

KIT

Fraunhofer IPK

TU Clausthal

Technical University of Munich

TUM

TECHNISCHE UNIVERSITÄT KAISERSLAUTERN

JYU
JOHANNES KEPLER UNIVERSITY LINZ

ESCP EUROPE
BUSINESS SCHOOL

FH JOANNEUM
University of Applied Sciences

LEUPHANA
UNIVERSITÄT LÜNEBURG

INITZ UNIVERSITY OF TECHNOLOGY

ETH Zürich

UNIVERSITÄT BONN

HiF
HELMHOLTZ-INSTITUT FREIBERG FÜR RESSOURCENTECHNOLOGIE

hhu
Heinrich Heine Universität Düsseldorf

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

TECHNISCHE UNIVERSITÄT DRESDEN

Wuppertal Institut

Borderstep Institute for Innovation and Sustainability

Technische Universität Berlin

RWTH AACHEN UNIVERSITY

Civil society and other institutions

WWF

European Climate Foundation

Agora
Verkehrswende

WORLD ECONOMIC FORUM

Management of KLiB
Kompetenznetzwerk Klima-Lohn-Batterien

NPM
NATIONAL PLATFORM FOR THE FUTURE OF MOBILITY

SUN Institute
Environment & Sustainability

Leopoldina
NATIONAL ACADEMY OF SCIENCES

acatech
NATIONAL ACADEMY OF SCIENCE AND ENGINEERING

UNION
DER DEUTSCHEN AKADEMIE DER WISSENSCHAFTEN

Energy Systems of the Future

The CEID is well equipped to drive the transformation towards a Circular Economy in Germany and beyond



50+

Over 50 members:

3 ministries, 20+ companies, 20+ scientific institutions and other relevant organizations from civil society to make the transition to a Circular Economy happen: **Collaboration along the value chain including all relevant stakeholders**

CEID
in
numbers

3

3 content deep dives:

Research questions of high political relevance

I. Circular Business Models: the role of digital technologies and regulatory frameworks as enablers for sustainability

II. Traction Batteries: resource productive scale-up of battery systems for electric mobility

III. Packaging: future-proof solutions for a circular plastic packaging industry

4

4 publications:

Insights are synthesized into actionable measures to support the transition to a Circular Economy:

- **collaboratively:** establishing value creation networks
- **concrete:** case studies provide relevant insights about incentives and barriers
- **innovative:** science-based recommendations on research gaps to support the transition

Topics of the Circular Economy Initiative: Combination of overarching topics with industry deep dives



II. Working Group Traction Batteries

Coordination:
Prof. Dr.-Ing. Arno Kwade/
TU Braunschweig
Dr.-Ing. Christian
Hagelüken/Umicore

- Vision 2030

Pilot profiles of projects:

- Knowledge of battery life
- Model-based decision platform for EoL use
- Battery disassembly network

I. Working Group

Circular Business Models

Coordination: Prof. Dr. Erik Hansen/ Head of the Institute for Integrated Quality Design (IQD) at Johannes Kepler University (JKU) Linz and Patrick Wiedemann/ Reverse Logistics Group
Business model typology – digital technologies – regulatory framework conditions



Circular Economy Roadmap for Germany

- Policy recommendations on technology development and regulatory framework
- Macroeconomic analysis of contribution to reduced material input and GHG emissions
- Vision 2030/2050



III. Working Group Packaging

Coordination:
Prof. Dr. Peter Elsner/
Fraunhofer ICT
Prof. Dr. Thomas Müller-
Kirschbaum/Henkel

- Vision 2030

Use cases:

- Non-Food – HDPE bottle
- Food – PET tray

Circular Business Models: Overcoming Barriers – Unleashing Potentials

Insights from acatech's Circular Economy Initiative Deutschland

Prof. Dr. Erik G. Hansen (Dipl.-Wirtsch.-Inf.)
Scientific Head of Working Group on Circular Business Models

1st February, 2022 World Circular Economy Forum (WCEF)

www.circular-economy-initiative.de



Members of the Circular Business Models working group



Work assignment & objectives of the working group



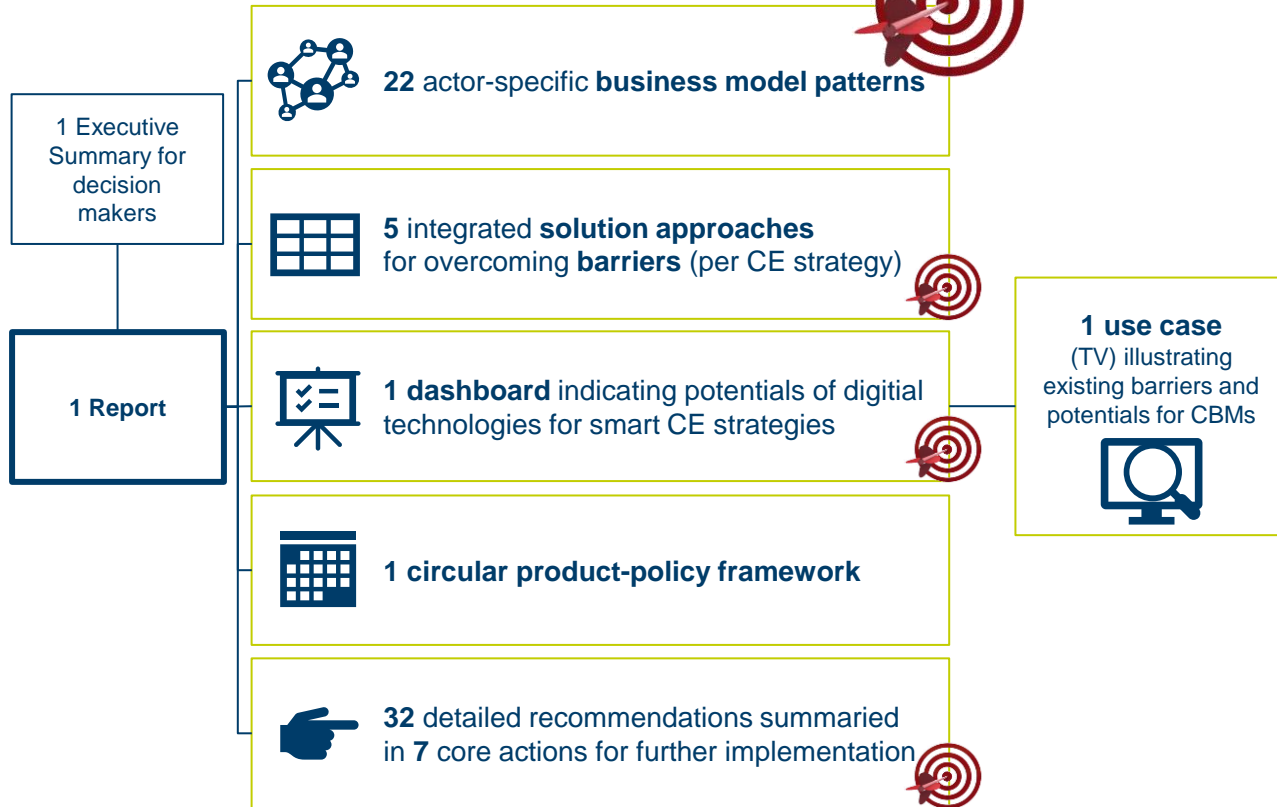
Development of a science-based handbook for the successful implementation of business practices promoting a Circular Economy

- ✓ Identification and description of **actor-specific circular business models (CBMs)** and their interactions in business ecosystems
- ✓ **Identification of existing barriers** to CBMs
- ✓ Identification of **digital and policy enablers** of CBMs
- ✓ Derivation of **specific recommendations for action** addressing decision makers in the areas of politics, business and science in order to accelerate system transition towards a CE

Results of the working group



Focus today



Review:

- **Prof. Fiona Charnley**, University of Exeter
- **Dr. Colin Fitzpatrick**, University of Limerick
- **Prof. Dr. Jur. Helmut Maurer**, Senior Legal Expert, European Commission
- **Dr. Max Marwede**, Fraunhofer Institute for Reliability and Microintegration (IZM)
- **Prof. Andrea Urbinati**, LIUC Business School

Launch:

on 22 October 2020 at the BMBF Conference on the German EU Council Presidency



Download: <https://en.acatech.de/publication/circular-business-models-overcoming-barriers-unleashing-potentials/>

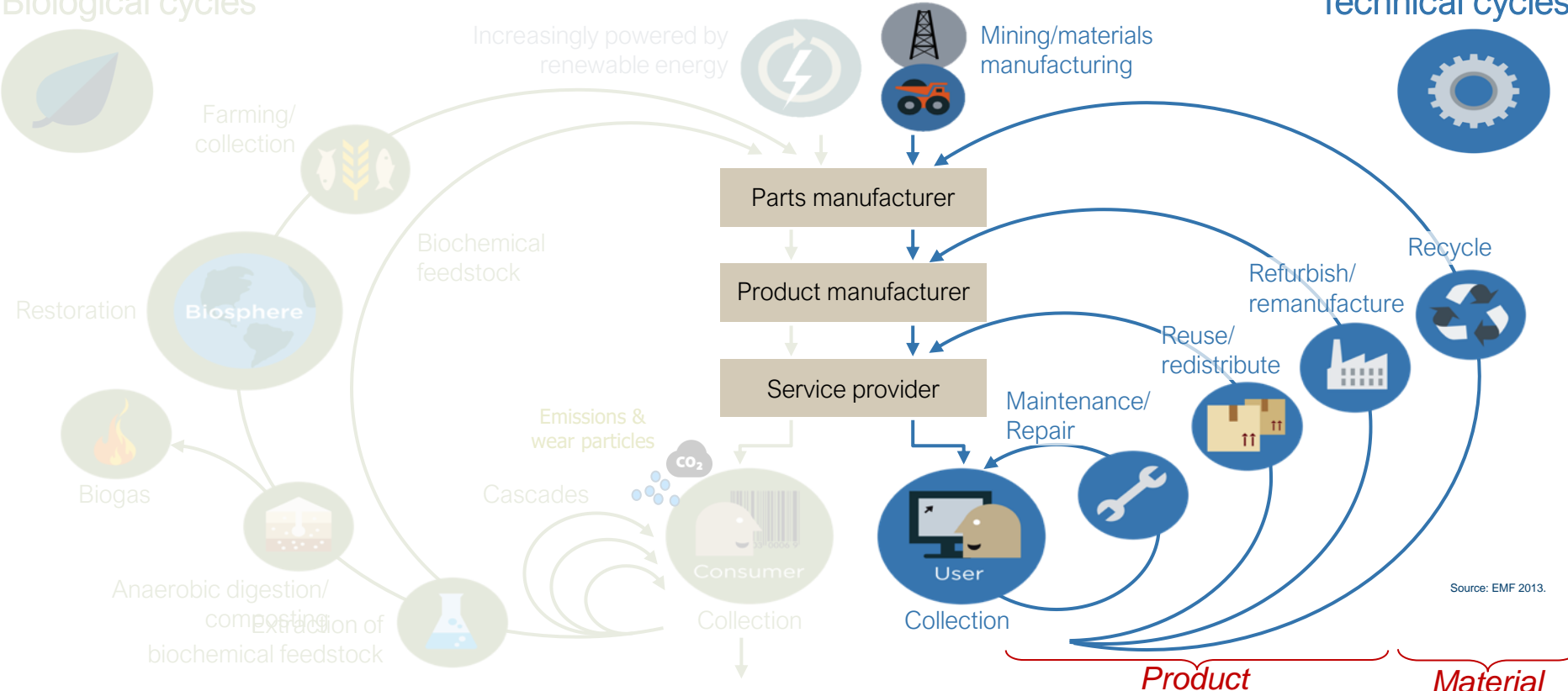
Circular Economy: Circular strategies



Technical cycles



Biological cycles



Source: EMF 2013.

Circular Economy strategies form the basis of circular business models. Focal actors can combine different circular business models for their company



Maintenance, upgrade and repair

Offering **prolonged usability and functionality** of products through maintenance, repair, and/or control services which reduce the need to buy and switch to new products.

Optionally, products are upgraded with new features or advanced performance.



Reuse

This strategy requires that used products flow (back) to service providers, either directly or via an intermediary.

The used products are then directly (re-)sold, perhaps in slightly enhanced form after cleaning, minor repairs, and repackaging, leading to **new forms of value capture**.



Remanufacturing

With remanufacturing, value creation processes change considerably.

Used or malfunctioning products are returned to the producer (or third-party provider), completely disassembled and reassembled with all parts, and the resulting product is restored to **quality equal to or better than the original product** (i.e. quality 'as new').



Recycling

Material recycling is about reusing materials for the same or different purpose.

Today's recycling processes often considerably reduce material utility and quality and can therefore be considered 'downcycling'.

New business models and related product design changes aim to retain material quality over multiple cycles and long periods of time so that **primary materials can be replaced**.

The working group proposes a typology of 22 CBM patterns (B2B/ B2C-markets)



Actor's main role	Circular strategy	Id	Business model pattern	Service Level (sub-pattern)		
				Product-oriented	Use-oriented	Result-oriented
Supplier (molecules/materials)		A1	Circular raw materials supplier	Molecule & material recycling	Materials bank	-
		A2	Process molecule service provider	-	Molecule & material leasing	Molecule & material performance
Supplier (mechanical engineering)		B1	Machines/components 'as new'	Machines/components 'as new'	Rental machines/components 'as new'	Pay per reman. machine performance
		B2	Machine/component remarketing	Used machines/component sales	Rental machines/components	→ see B1 Pay per reman. machine performance
Producer		C1	Proprietary material cycles	Waste cherry picking	Materials bank partnership	-
		C2	Product 'as new'	Selling Products 'as new'	Product leasing 'as new'	→ see C6 Total care producer
	C3	Used product remarketing	Used product sale	-	-	
	C4	Out-of-warranty repair service	On-demand repair	→ see C6 'Leasing producer'	→ see C6 Total care producer	
	C5	Upgrades, spares & accessories	Modules & accessories shop	Upgrade subscription	-	
	C6	Maximising product uptime	Fee-based maintenance	Leasing producer	Total care producer	
Retailer & service points		D1	Retailer as cycle manager	Retailer as cycle manager	→ see C1 Materials bank partnership	-
		D2	Retail remarketing & reman.	Used goods on sale	Rent-a-wreck fleet manager	-
		D3	One-stop shop (retail)	Integrated service point	Rental retail	Total care retail
Repair provider		E1	Repair gap exploiter	Repair transaction	Repair-based rental	-
Prosumer		F1	Prosumersupport system	Do-it-yourself repair	Peer-to-peer sharing	-
Logistics provider		G1	Material reverse logistics	-	-	Pay per recycling logistics performance
		G2	Refurb. logistics services	-	-	Pay per refurb. performance
		G3	Spare parts management	-	-	Pay per spare part performance
Recovery manager		H1	Revitalised products	Used goods bargain	-	-
		H2	Coordinator of informal collection	Fair-trade recycles	-	-
Intermediary		I1	Recycling platform	Recycling platform	-	-
		I2	Used goods & sharing platform	Used good platform	Sharing platform	-
Emerging actors	All	ILx	?	?	?	?

The typology is structured along 3 dimensions:



I. Actor's role
supplier, producer, retailer & service provider, repair provider, prosumer, logistics provider, recovery manager, intermediary, emerging actors

II. Circular strategy (≈technical cycle)

- recycling
- remanufacturing
- reuse
- maintenance, repair & upgrade



III. Service level

- product-oriented
- use-oriented
- result-oriented

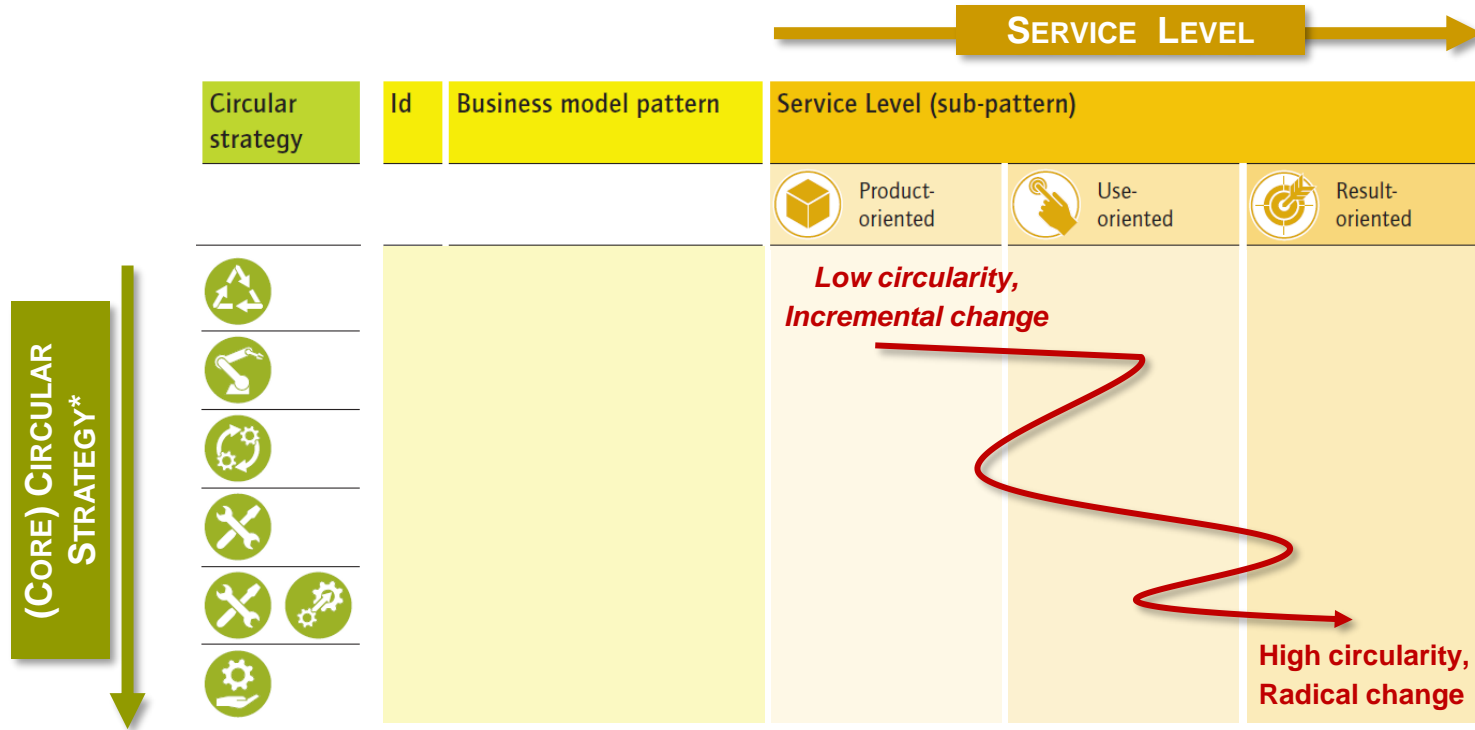


Companies have the incentive to maximise the number of products sold.

Companies are paid for product availability (e.g. leasing, pay-per-performance).

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“

Circular strategy and service level determine business model's maturity



*Higher-level strategies include the possibility to pursue lower-level strategies simultaneously, increasing the synergistic potential for circularity

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“ (based on Hansen et al. 2020a, p. 12)

Typology of 22 CBM patterns: Overview Part 1 of 2



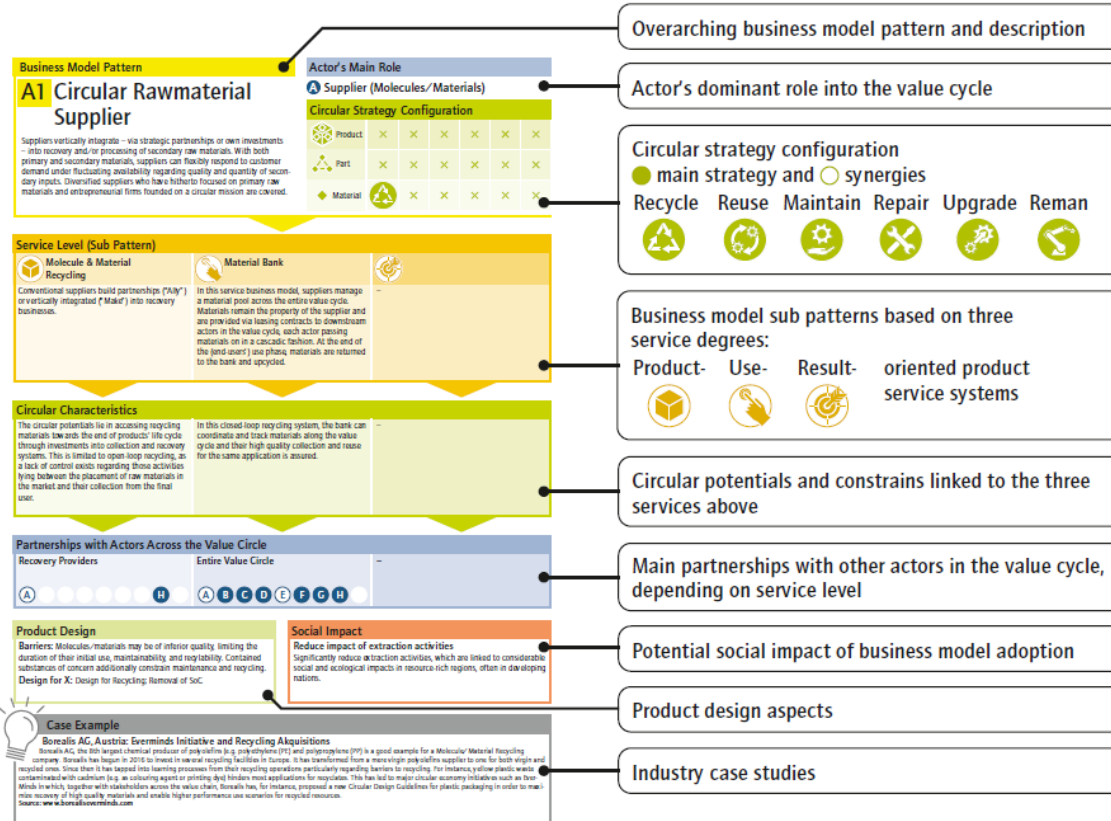
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Supplier (mechanical engineering)		B1	Machines/components 'as new'	Machines/components 'as new'	Rental machines/components 'as new'	Pay per reman machine performance
		B2	Machine/component remarketing	Used machines/component sales	Rental machines/components	→ see B1 Pay per reman machine performance
Producer		C1	Proprietary material cycles	Waste cherry picking	Materials bank partnership	-
		C2	Product 'as new'	Selling Products 'as new'	Product leasing 'as new'	→ see C6 Total care producer
		C3	Used product remarketing	Used product sale	-	-
		C4	Out-of-warranty repair service	On-demand repair	→ see C6 'Leasing producer'	→ see C6 Total care producer
		C5	Upgrades, spares & accessories	Modules & accessories shop	Upgrade subscription	-
		C6	Maximising product uptime	Fee-based maintenance	Leasing producer	Total care producer

Exemplary business model patterns (see next slides)

part 1 of 2

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“ (based on Hansen et al. 2020a, p.13)

Detailed business model patterns offer managers guidance for the evolution of their business model, role in the value cycle, and partnerships



Overarching business model pattern and description

Actor's dominant role into the value cycle

Circular strategy configuration
 ● main strategy and ○ synergies
 Recycle Reuse Maintain Repair Upgrade Reman

Business model sub patterns based on three service degrees:
 Product- Use- Result- oriented product service systems

Circular potentials and constraints linked to the three services above

Main partnerships with other actors in the value cycle, depending on service level

Potential social impact of business model adoption

Product design aspects

Industry case studies

- The typology provides practitioners with a **comprehensive overview** regarding their respective focus, circular potentials, and product design needs.
- The patterns can be combined by a **single actor** to build a more comprehensive business model and **interlinked across different actors** in the value cycle.

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“

Exemplary pattern: B1 Machine/Component “As New”



Business Model Pattern

B1 Machine/Component “As New”

Machines/components are taken back from customers, quality is checked, fully disassembled, worn parts/materials are exchanged, and then they are fully reassembled. Remanufactured machines have equal or superior quality at lower costs.

Actor's Main Role
B Supplier (Machine building)

Circular Strategy Configuration

Product	×	⌚	×	×	×	↻
Part	×	⌚	×	×	↻	↻
Material	♻️	×	×	×	×	×

Remanufacturing



SKF

Service Level (Sub Pattern)

<p>Machines/Components “as New”</p> <p>Machines/components are sold in traditional form. Take-back system and infrastructure is offered.</p>	<p>Rental Machines/Components “as New”</p> <p>Machines are rented or leased out instead of sold. Ownership is not transferred to the customer. Customer relationships intensify over entire use phase.</p>	<p>Pay per Reman Machine-Performance</p> <p>Remanufactured machines/components are offered as a service to customers. They are closely monitored and analysed for their performance and performance improvements and are modified or replaced once suitable against the background of Total Cost of Ownership.</p>
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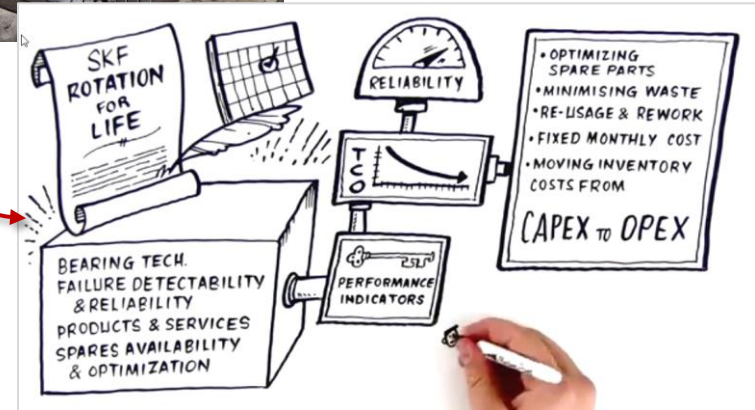
Pay per performance

Circular Characteristics

In order to get products back, financial incentives (e.g. reduced price for repeat sales; deposit) are offered. However, despite incentives, return of products cannot be ensured and related planning is difficult.	Rented/leased machines will usually come back to the owner after contract ends (or significant fines apply). With well planable take-back quantities and timeframes, remanufacturing processes and related procurement of further materials/components can be optimally planned.	This service business model leads to higher reman shares, because machines/components remain in ownership of the supplier and are returned at the end of the service contract. Furthermore, suppliers will strive for performance optimisation and integrated maintenance and repair as a basis for learning-in-use and feedbacks into research and development and related product designs.
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Partnerships with Actors Across the Value Circle

Close ties with immediate customers	Close ties with immediate customers	Close ties with immediate customers
(B) (C) (G)	(B) (C) (G)	(B) (C) (G)



Source: SKF Österreich AG (SKF), <https://bit.ly/30JNllw>.

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“

Exemplary pattern: C2 Product “As New” (Remanufacturing)



Business Model Pattern

C2 Product “As New”

Companies offer products with “Quality as New” (i.e. equal or better quality than “virgin” products), but at more competitive pricing. Customers get financial incentives for returning products (e.g. deposit, discounts). Returned products are then quality checked, fully disassembled, worn parts/materials replaced, and then reassembled. Reman activities are usually centralised and are similar/remain close to primary production.

Actor’s Main Role

Producer

Circular Strategy Configuration

Product	×	×	×	×	×	×	×	×	×
Part	×	×	×	×	×	×	×	×	×
Material	×	×	×	×	×	×	×	×	×

Remanufacturing



Before



After

Service Level (Sub Pattern)

Selling Products “as New”

Remanufactured products are sold in the same way as new products, but at more competitive conditions (i.e. lower price tags).

Product Leasing “as New”

Customer leases (or rents) products “as new” for a monthly fee. The leasing product pool consists of remanufactured products, but is replenished by new products.

→ see C6 Total Care Producer

Product-oriented business model

Circular Characteristics

In order to get products back, financial incentives (e.g. reduced price for repeat sales, deposit) are offered. Reuse transactions depend on whether customers use the incentives by suppliers to indeed return them. However, customers may prefer to sell them on the second-hand market themselves, with goods then leaving the control of the producer.

As ownership remains with the producer, all products are returned at defined points in time. This allows for accurate planning of the subsequent reman processes and the size of the product pool. It also allows for better product (and user) monitoring which can increase (and ensure a minimum) quality of returned products and thereby make sure that remanufacturing is possible and at lowest possible costs.

Partnerships with Actors Across the Value Circle

Dealers for take-back

Dealers for take back or as fleet managers

Product Design

Barriers: Low-cost design prevents disassembly and upgrading. Premature product, component or material failure prevent their reuse and increase remanufacturing costs.

Design for X: Design for Durability of Products, Components, Materials; Design for Modularity (Technology Upgrading)

Social Impact

Regional job growth; Integrate people with disabilities

New regional jobs in labour-intensive reman processes (e.g. disassembly, quality control, recondition), which may integrate disabled people (some with special abilities) at lower labour costs (e.g. public funding).

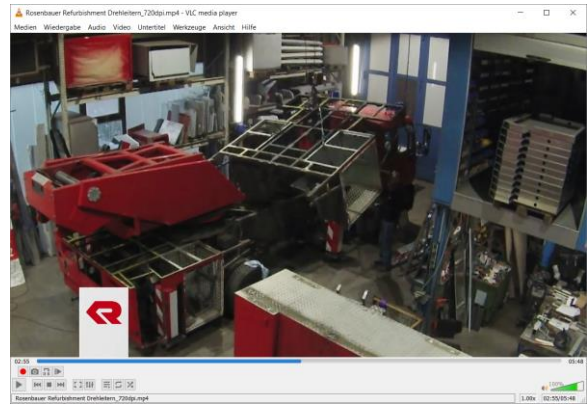
Case Example

Smartmeter Remanufacturing, Messtechnikhersteller Lorenz, Germany

The Lorenz company sells or leases Smart Meters to households (via intermediary organisations such as building management providers). They are designed for several use cycles and then produced, and returned to the producer. As financial incentives, customers get a payback for each product returned. Smart Meters are then disassembled and refurbished using specialised machinery. As a basis, the product was developed according to design for remanufacturing and modularity principles.

Source: www.lorenz-messtechnik.de

More Cases: Apple “Refurbished” (e.g. smartphones); Caterpillar Reman (heavy equipment/vehicles)



Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials”

Sources: Rosenbauer Group, <https://www.rosenbauer.com/blog/en/refurbishment-a-second-life-for-a-fire-truck/>
<https://www.youtube.com/watch?v=KMTvB9SxXM>

Exemplary pattern: C5 Upgrade, Spares & Accessories



Business model pattern

C5 Upgrades, spares & accessories

Producers provide spare parts, tools, and related services for their core products, either through own online or offline sales channels, or by partnering with retailers and local service shops. This requires core products to follow a modular design which makes them easily repairable either directly by consumers (do-it-yourself) or by decentralised service points without any need for special training.

Actor's main role

Producer

Circular strategy

Product	x	x	x	x	x
Part	x	x	x	x	x
Material	x	x	x	x	x

Service Level (sub-pattern)

Modules & accessories shop

Producers offer spare parts as a traditional sales transaction. Own direct sales channels or partnerships with existing retail and service points (online or offline) are used for customer contact.

Upgrade subscription

New technological or non-technological modules/parts, which remain in the ownership of the producer, are provided as a service to enable upgrading of customers' core devices at defined intervals. Modules are returned once replacement upgrades are provided or customers no longer need them. New modules are provided to high-performance users and then cascaded to users with lower needs.

Circular characteristics

Provision of spare and upgrade modules supports decentralised repairs and upgrading with the ultimate aim of increasing a core product's longevity. Apart from the module sales transaction, the repair and upgrading processes remain strongly in the domain of the customers with little feedback to the producer, who misses learning opportunities arising from a product's shortcomings.

Extended use of core product is facilitated through preventive and technology upgrades. With producers retaining ownership of modules, opportunities arise for component and (co) device monitoring, which enables preventive maintenance. Risks of component-level fashion obsolescence or 'upgrade consumerism' need to be contained (eco impacts of cumulative upgrades vs. core product).

Partnerships and coverage of value circle

DIY customers; retail & repair partners; logistics

DIY customers; retail & repair partners; (retro) logistics

Product design

Barriers: Current product designs focused on integration and miniaturisation prevent module replacements and related after-sales opportunities.

Design for X: Design for modularity, reparability.

Social impact

Support for DIY communities

By providing spares and accessories to users and related do-it-yourself (DIY) communities (e.g. repair cafes, informal or independent repairs), producers support a culture of care for products and reparability and foster the development of circular literacy among users and broader society.

Case example

Fairphone's online shop for spare parts, the Netherlands

Fairphone, founded in 2013, is a social enterprise with the mission to transform the electronics industry. By introducing alternative smartphones onto the market, it showcases new supply chain practices (e.g. fairly traded gold) and product designs (e.g. replaceable batteries), as well as fostering sustainability. The 3rd generation design, Fairphone 3, has recently been introduced. The modular phone is shipped with a screwdriver, with which the phone can be easily disassembled by consumers into seven main modules (e.g. battery, display, mainboard, camera, speaker, microphone). Fairphone's online shop follows the modules & accessories business model, as it provides replacements for each of these modules, as well as for normal accessories (e.g. chargers, cases).

Source: www.fairphone.com

Sources: <https://www.fairphone.com/de/camera-upgrades-for-fairphone-3/>

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“

Typology of 22 CBM patterns: Overview Part 2 of 2



Actor's main role	Circular strategy	Id	Business model pattern	Service Level (sub-pattern)		
				Product-oriented	Use-oriented	Result-oriented
Retailer & service points		D1	Retailer as cycle manager	Retailer as cycle manager	→ see C1 Materials bank partnership	-
		D2	Retail remarketing & reman	Used goods on sale	Rent-a-wreck fleet manager	-
		D3	One-stop shop (retail)	Integrated service point	Rental retail	Total care retail
Repair provider		E1	Repair gap exploiter	Repair transaction	Repair-based rental	-
Prosumer		F1	Prosumer support system	Do-it-yourself repair	Peer-to-peer sharing	-
Logistics provider		G1	Material reverse logistics	-	-	Pay per recycling logistics performance
		G2	Refurb logistics services	-	-	Pay per refurb performance
		G3	Spare parts management	-	-	Pay per spare part performance
Recovery manager		H1	Revitalised products	Used goods bargain	-	-
		H2	Coordinator of informal collection	Fair-trade recycles	-	-
Intermediary		I1	Recycling platform	Recycling platform	-	-
		I2	Used goods & sharing platform	Used good platform	Sharing platform	-
Emerging actors	All	J1..x	?	?	?	?

← Exemplary pattern (see next slide)

Table: Overview of circular business model patterns and sub-patterns, Source: based on Hansen et al. 2020a, p. 13

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“ (based on Hansen et al. 2020a, p.13)

Exemplary pattern: D3 One-stop shop (retail)



Business model pattern

D3 One-stop shop (retail)

As well as conventional sales, retailers offer extended services such as maintenance, repair, upgrading, and take-back.

Actor's main role

D Retailer & service points

Circular strategy

Product	×	×			×	
Part	×			×	×	×
Material		×	×	×	×	×

Service Level (sub-pattern)



Integrated service point

Complementary or optional maintenance, repair, and insurance service components are sold together with the core product under a conventional transactional sales model.



Rental retail

The retailer leases or rents out products for a monthly fee and keeps ownership and responsibility for maintenance, repair, upgrading, and take-back. Customers profit from accessibility to most recent products.



Total care retail

Instead of a specific product, a result or performance is sold to the customer. The provider can choose (used) products/technologies which best deliver the result and has full responsibility for deployment, maintenance (may include consumables), repair, replacement and take-back.

Circular characteristics

With the same point of contact and service offerings linked to or included in the original product purchase, complexity and transaction costs are reduced for the customer, and it becomes more likely that customers will return products for maintenance, repair and related services. This maximises product lifetime and environmental benefits.

The retailer becomes a fleet operator. Professional maintenance and repair maximises product lifetime. Once products retire, they can be professionally prepared for appropriate recycling.

- Ensuring the correct time intervals for maintenance activities in order to maximise lifetime.
- Leveraging synergies from maintenance/repair activities by reusing component and materials.
- Ensuring take-back after service ends as the basis for deployment on other customers' sites, remarketing or recycling.

Partnerships and coverage of value circle

Producers of goods; 3rd-party service providers



Strong customer relationship; producers



Producers to fill product pool; close customer ties



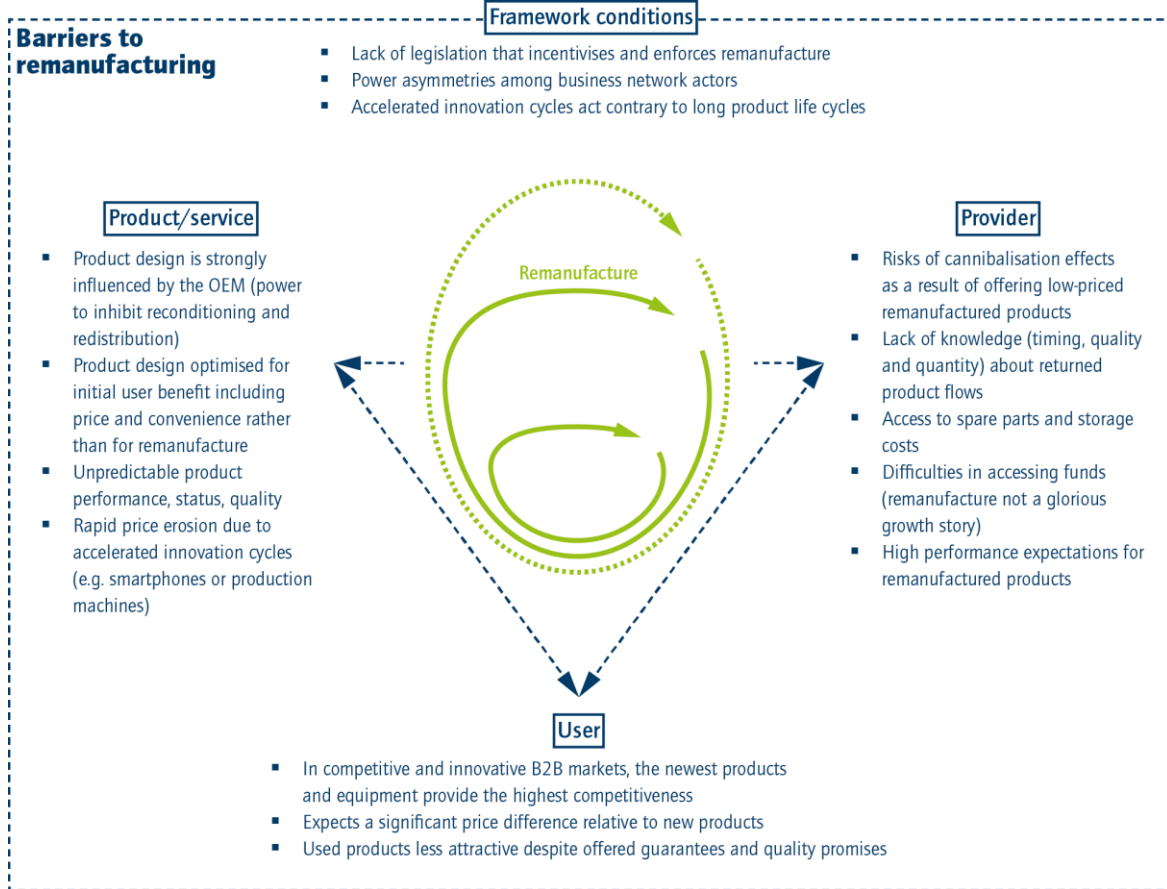
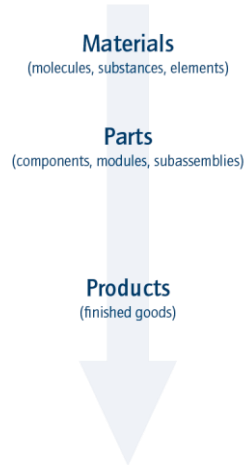
The screenshot shows the 'MagentaZuhause L' website. At the top, it displays the tariff details for 'MagentaZuhause L' at 19,95 € monthly, with a note that from the 7th month, it costs 44,95 € monthly plus a one-time setup fee of 69,95 €. Below this, it asks the user to 'Wählen Sie jetzt Ihren Router' (Choose your router now). A text box explains that to use MagentaZuhause, an IP-capable router is needed and asks if the user already owns one or wants to rent. Three router options are presented:

- Heimnetz Paket Smart Plus:** Includes Speedport Smart 4 and Speed Home WLAN. Price: 4,98 € monthly (from 7th month: 9,95 € mtl.).
- Heimnetz Paket Smart:** Includes Speedport Smart 4 and Magenta SmartHome Pro. Price: 5,95 € monthly.
- Speedport Pro Plus:** For ADSL/VDSL(Super) Vectoring or Fiber. Price: 9,95 € monthly.

At the bottom, there are options for one-time or monthly payments and a 'IN DEN WARENKORB' (Add to cart) button.

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“

Barriers to remanufacturing (exemplary circular strategy)

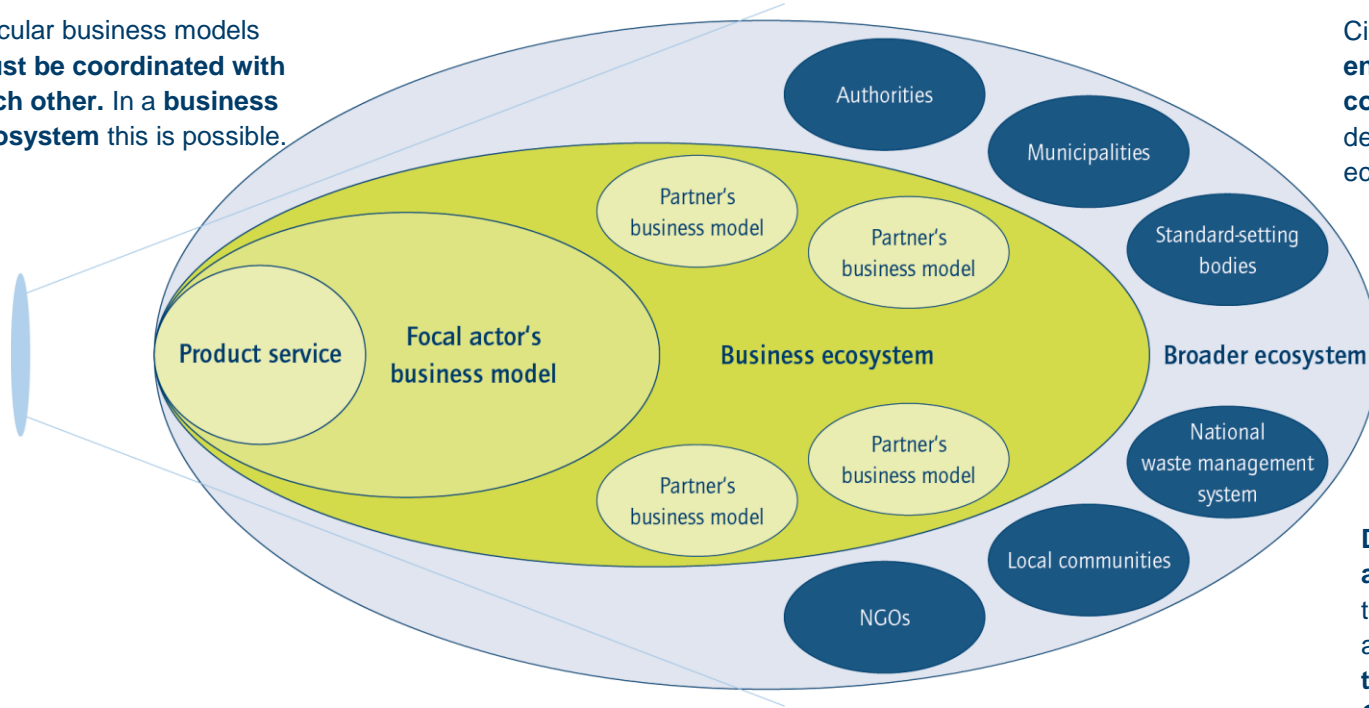


Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“

Increased need of collaboration in business model ecosystems



Circular business models **must be coordinated with each other.** In a **business ecosystem** this is possible.

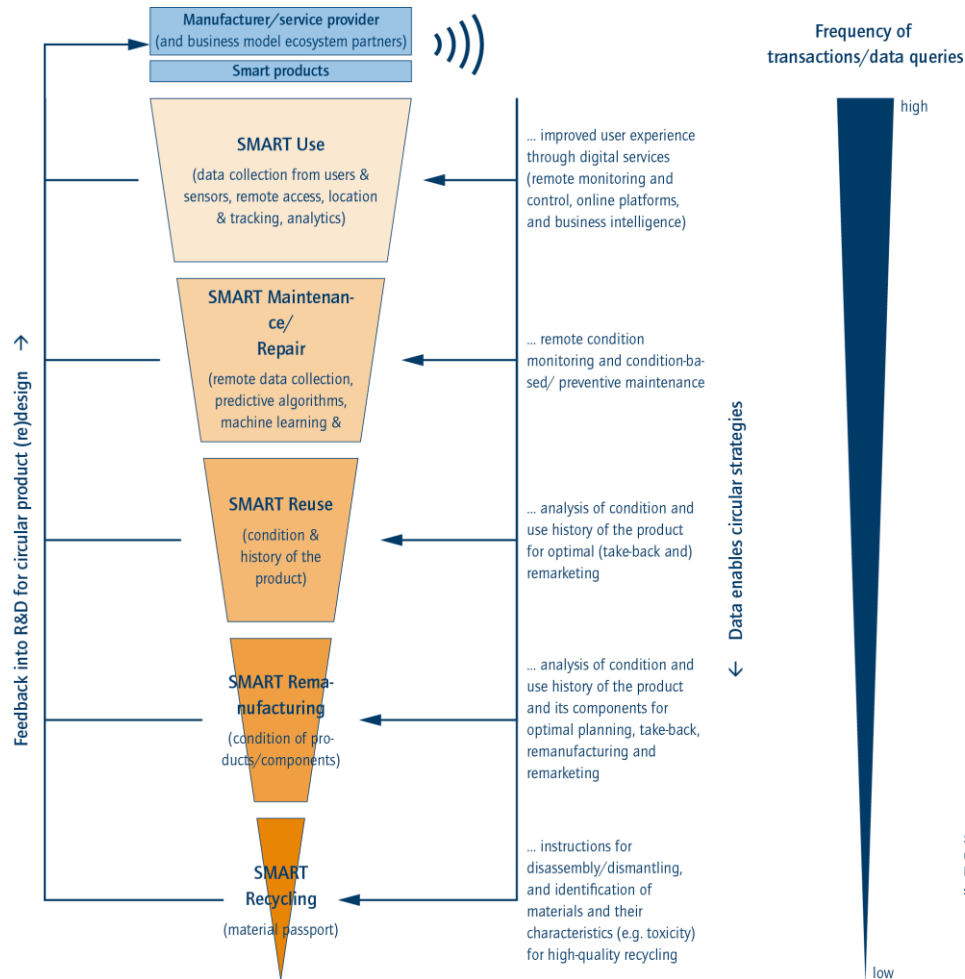


Circular business models create **entrepreneurial added value** and **contribute** to the systemic development towards a circular economy.

Decision-makers at the meso and macro levels can add value to the business model ecosystem and **support the systemic transformation towards a Circular Economy.**

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“ based on Konietzko et al. 2020b







Digital enablers for (smart) circular strategies



Source: Hansen et al. (2020), Circular Economy erfolgreich umsetzen: die Rolle von Innovation, Qualitätsstandards & Digitalisierung (Quality Austria Whitepaper), Vienna. see also: CEID/SYSTEMIQ (2021) p. 54

The working group has compiled a “Circular Economy policy toolbox” for developing a holistic policy mix



Circular strategies					
Circular Economy policy enablers	Cross-strategy	Maintain, repair, and upgrade   	Reuse 	Remanufacture 	Recycle 
Economic instruments					
Regulatory instruments					
Standards					
Informational instruments & awareness raising					
Government procurement					

The toolbox presents the most relevant policy instruments plotted along two dimensions: type of policy instrument and CE strategy

The toolbox is intended to enable policy makers to go beyond the existing recycling focus in policy-making.

Source: Circular Economy Initiative Deutschland, 2021: „Circular Business Models: Overcoming barriers, unleashing potentials“

The working group identifies 7 overarching recommendations



Experimenting with business models:

Exploring circular business models with innovations in product design, service processes and value partnerships.



Development and harmonisation of standards:

Evaluation & classification of products, components and high-quality secondary raw materials



True cost pricing and economic incentives:

Development of a market-based framework on the basis of established Ex'tax principles; targeted support of circular product development with corresponding service business models



Information, awareness and user skills

Training and education programmes and better product information and labelling



Long-term institutionalisation:

Establishment of a central national body that aligns the outlooks of politics, business and society



Establishing a coherent policy framework for circular products:

Minimum requirements for circular product design, product ID, producer responsibility along the PLC, avoidance of end-of-product status



Public procurement:

Definition of strategic targets and quotas for used, remanufactured and recycled products and prioritisation of corresponding suppliers

Source: Circular Economy Initiative Deutschland, 2020: „Circular Business Models: Overcoming barriers, unleashing potentials“