Engineering Plastics for the Electronics industry: beyond mechanical recycling

Meet your presenter

Introduction

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Covestro AG

Forward-Looking Statements

This presentation may contain forward-looking statements based on current assumptions and forecasts made by Covestro AG.

Various known and unknown risks, uncertainties and other factors could lead to material differences between the actual future results, financial situation, development or performance of the company and the estimates given here. These factors include those discussed in Covestro's public reports which are available on the Covestro website at www.covestro.com.

Covestro assumes no liability whatsoever to update these forward-looking statements or to conform them to future events or developments

Covestro – leading in the world of polymers

Strong

- €10.7 bn in sales
- 16,500 employees[1]

Useful

- Plastics, pre-products and solutions
- For many industries

Global

- 33 production sites globally
- Close to customers and partners

Innovative

- 1,200+ employees in research and development
- 80 years of ideas and inventions

Financial year 2020

[1]calculated as full-time equivalent (FTE)

Key industries in focus

Automotive and transportation	Construction	Wood and furniture	Electrics and electronics	Chemicals	Sports/leisure, cosmetics, health and others
					
19%	16%	17%	13%	7%	28%

Percentages: Share of total sales in financial year 2020

Ideas for the world of tomorrow

Global cutting-edge research

Courageous innovations are necessary to master the current global challenges.

With our research and development, we aim at more sustainability and SDG-compliant products and solutions.

To reach this goal, we operate four innovation hubs in America, Asia and Europe.

Through this global presence we understand the local needs and can develop tailor-made solutions.

Pittsburgh

Leverkusen

Amagasaki

Shanghai

€ 262 m
Investments in research and development

1,200+ employees in R&D

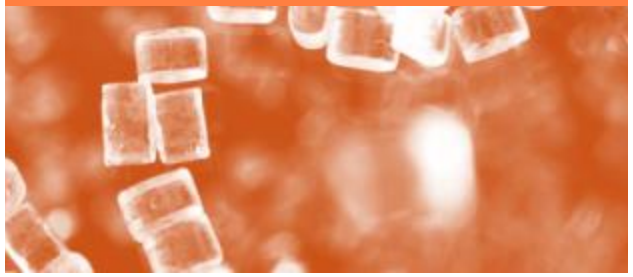
Our polycarbonates portfolio

Makrolon®

Transparency, high heat and high impact
(PC)

Apec®

Transparency, higher heat resistance
(HH PC)



Bayblend®

Good balance of high flow, impact strength and chemical resistance
(PC+ABS; PC+ASA)

Makroblend®

High toughness, chemical resistance, low temperature ductility
(PC+PBT; PC+PET)

Where do we want to go?

Covestro will fully embrace Circular Economy

“We will be fully circular”

Strong vision substantiates Covestro purpose of making the world a brighter place

Embed circularity throughout the company

Become shaping force for Circular Economy

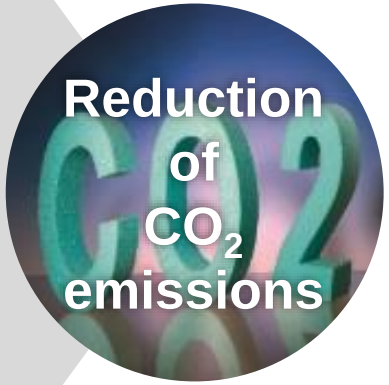
Contribute to greenhouse gas neutral economy

Alternative raw materials

Innovative recycling

Joint solutions

Renewable energy



Circular Economy

Covestro offers material solutions and design support

Mechanical Recycling

Makrolon® and Bayblend® with post-consumer or post-industry recycled content for different applications

Renewable attributed Polycarbonates

High quality, certified*, mass balanced polycarbonates - bio-circular resources replace fossil resources

Design for Sustainability

Circular Design Guidebook for E+E industry for customer product design co-creation to drive “Circular Design”

Gradually shift products from fossil to renewable

Commercialize new sustainable products to accelerate in the circular economy

Let's imagine
what a brighter world feels like

"Increase renewable material in their portfolio"

Procurement Director

"Easy to implement with no process interruption"

Production Manager

"No quality test required"

Quality assurance engineer

"Lower carbon footprint in scope 3 emissions"

Sustainability Manager

"Engaging story to tell with a real impact"

Brand Manager

COVESTRO NOW OFFERS

MAKROLON® RE WITH UP TO 72% OF THE PRODUCT BIO-CIRCULAR ATTRIBUTED VIA MASS BALANCE*

Makrolon®	RE
Bayblend®	RE
Makroblend®	RE

(*acc. ISCC PLUS Standard)

Alternative **raw materials** are introduced into the value chain

Raw material categories defined by ISCC PLUS standard

Bio: feedstock from virgin biomass

Bio-circular: waste and residues of biological origin (e.g. used cooking oils)

Circular : feedstock from waste / processing residues which are not landfilled or burned

For use of logos, consider ISCC PLUS requirements.

Principle of Mass Balance Approach

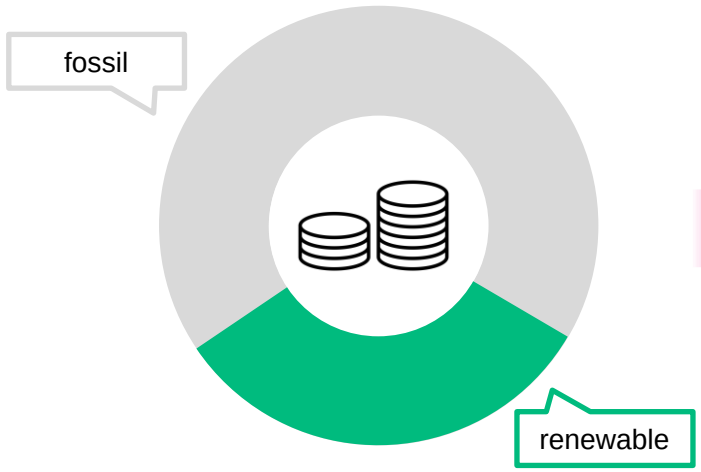
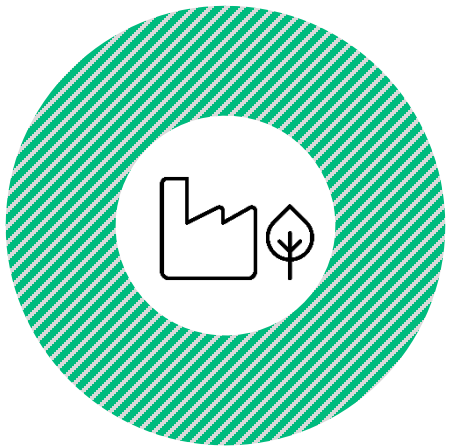
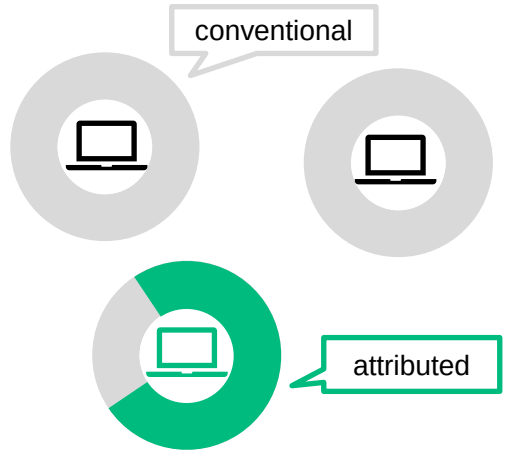
Feedstock	Value chain	Products
		
Substitution of fossil feedstock by renewable feedstock in petrochemical production	**Co-feeding fossil based and renewable raw materials into existing plants all along the value chain**	**Attribution of the renewable content to dedicated products according chemical feasibility**

Illustration based on Nova institute

Makrolon® RE

The **physical, mechanical, thermal, optical, weathering and processing properties** of Makrolon® RE resin are **identical** to conventional Makrolon® resin

Makrolon® RE series | the drop-in renewable alternative to fossil polycarbonates

1 **Same** Product Performance

- **Same** General properties
- **Same** Lot-to-lot consistency
- **Same** Optical performance

2 **Easy** Spec-in Process

- UL card – **Co-listed**
- Processing parameters
- Processing window

3 **Better** CO2 Footprint Reduction

- Up to **~100%***

*by end of 2021, starting from Germany Plant

Equivalency verified by Covestro

Makrolon® RE resins are **Identical** to conventional Makrolon® resins*

*For example: You can **replace the existing** Makrolon® 2407 with Makrolon® 2407 RE*

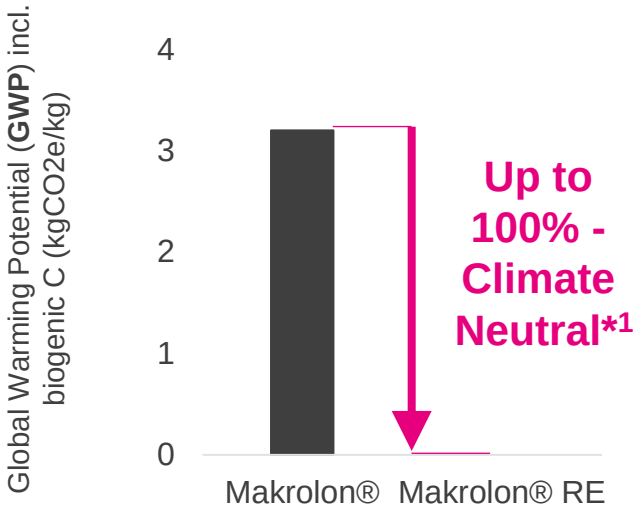
	Raw Material Specification	Resin Production Process	Product Formulation	Product Specification
 Makrolon® 2407	✓	✓	✓	✓
 Makrolon® 2407 RE	✓	✓	✓	✓

* Product and quality equivalency confirmed under actual production conditions for representative product

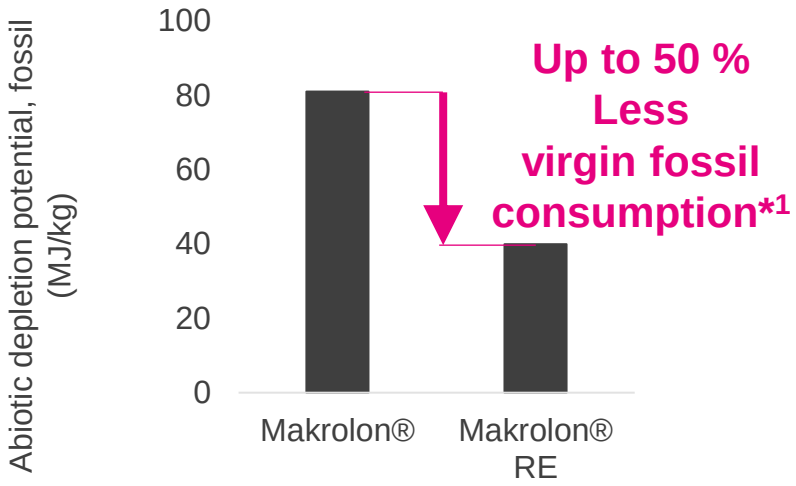
Low Carbon Footprint **Makrolon® RE** saves fossil resources

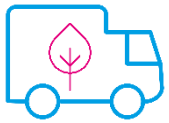
Polycarbonates with claimable environmental benefits

Climate contribution:
Lower Carbon Footprint

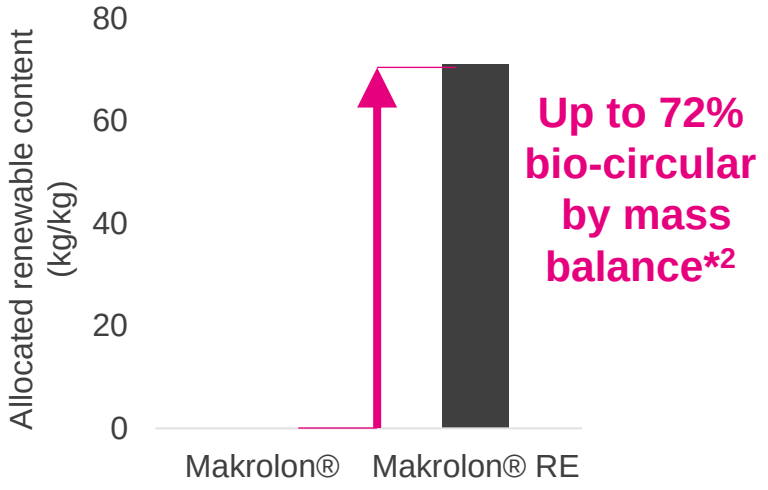


Preserving resources:
Virgin fossil savings





Use of alternative
raw material



*Specific product savings differ according product properties. Shown values represent planned selected Makrolon RE grades.
[1] According preliminary reviewed LCA. [2] According ISCC PLUS Certification.

Our **RE** polycarbonate/blend grades make it possible

Starting portfolio for various EE applications

RE

We offer known products: certified, attributed with mass balanced **bio-circular feedstocks** which can be used as a **drop-in solution**

Notebook

Makrolon® CF9920R30 **RE***

Bayblend ® FR3040 R35 **RE***

Bayblend ® FR3025 R35 **RE***

Bayblend® FR3021 **RE***

Bayblend ® FR3040W **RE***

Housing

Bayblend® FR3008 **RE***

Makrolon® FR6005 **RE***

Makrolon® FR6020 **RE***

Multiple

Makrolon® 2407**RE****

Makrolon® 2807 **RE****

Makrolon® 6557 **RE****

EV Charger

Makrolon® 6487 **RE****

Electronics & Appliances

Bayblend® FR3010 **RE****

The Suffix RE indicate our new grades, attributed with **bio circular feedstock via mass balance**.

Climate neutral version available as of Q4 2021

Status Aug 2021: * planned for APAC, ** planned for EMEA

Our **RE** polycarbonate/blend grades make it possible

As of December 2021

Makrolon® RE

Bayblend® RE

Current offering:

- ISCC Plus Certification of UER and CAO production sites and COV HK / COV SI trading companies
- ISCC Plus Sustainability Declaration
- Bio-circular content from rPhenol and rAcetone
- Powered by renewable energy (Q4 2021)
- Equivalency Statement
- RE Technical Data Sheet
- UL Yellow Card
- Product Family LCA

Exciting NEW Journey

We’re looking forward to joining you on this exciting new journey to become fully circular

Join us at **CES 2022**!

In person and virtually

Our global team is here for you…

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Engineering Plastics