



# Creating carbon cycles

Key to climate neutrality  
and resource protection

Tara Nitz  
3<sup>rd</sup> Conference: Sustainable Chemical Conversion in  
Industry

[covestro.com](https://www.covestro.com)

11/12/2020

3rd Conference: Sustainable Chemical  
Conversion in Industry

**INTERNAL**



# Covestro at a glance



# Covestro – leading in the world of plastics



We are pushing boundaries to make the world a brighter place

## Leading position

- 17,200 employees<sup>1</sup>
- €12.4 bn. in sales
- Listed on the DAX stock exchange



## Broad portfolio

- Products and solutions for many industries and vast applications



## Global Player

- 33 production sites globally
- Close to markets, customers and suppliers



## Highly innovative

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



Financial year 2019  
<sup>1</sup>calculated as full-time equivalent (FTE)

# Our segments and key industries in focus

Large Portfolio for various applications



**Polyurethane** – Insulation of buildings and of cooling units, or giving comfort in car seats, mattresses, and upholstery  
**Polycarbonate** – Robust, break-proof, light-weight, high design flexibility and excellent substitute for glass or metal  
**Coatings, Adhesives, Specialties** – Protect and decorate, specialty films, cosmetics, textiles and health

Automotive and  
transportation



20%

Construction



16%

Wood and  
furniture



16%

Electrics and  
electronics



13%

Chemicals



7%

Sports/leisure,  
cosmetics, health  
and others



28%

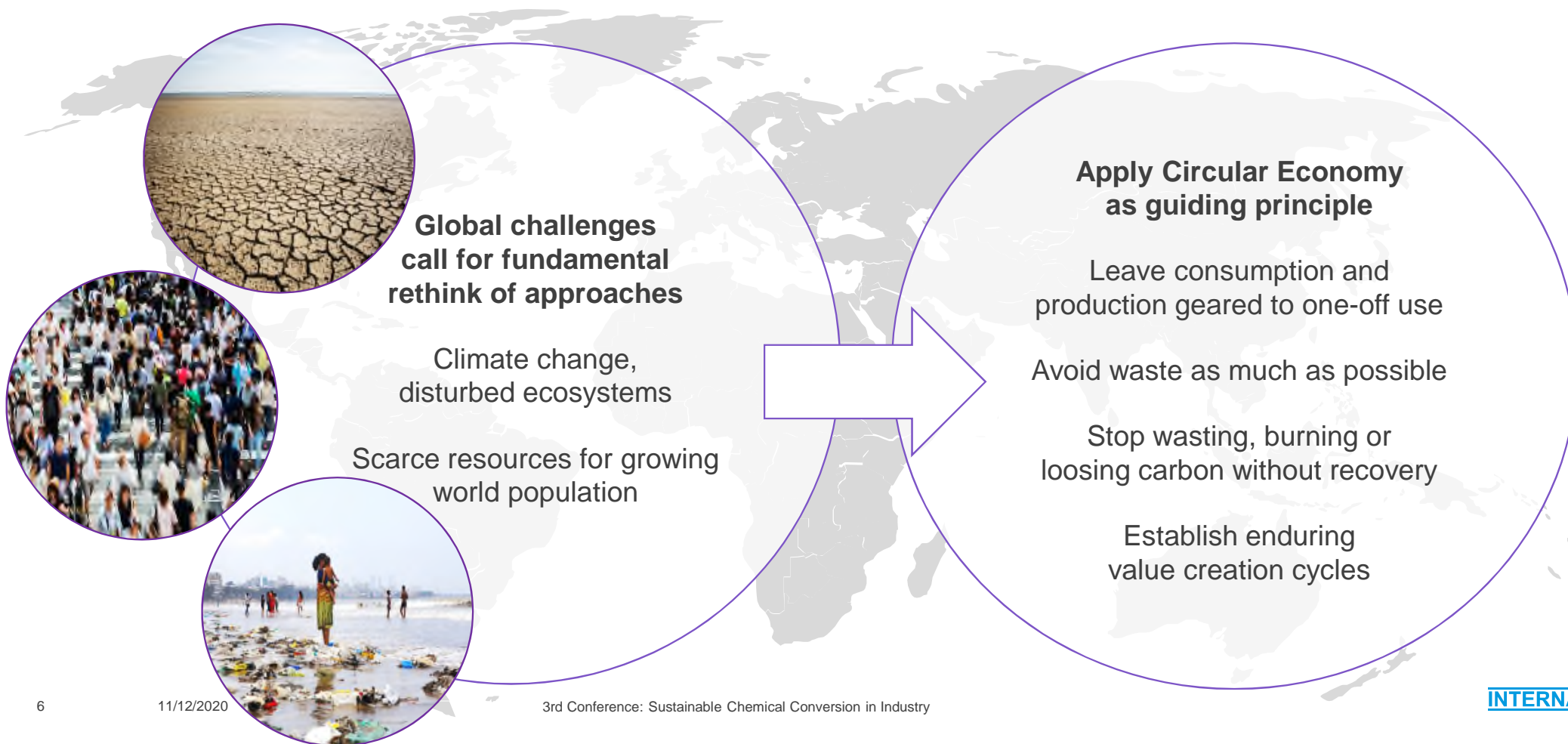


# Why Circular Economy?



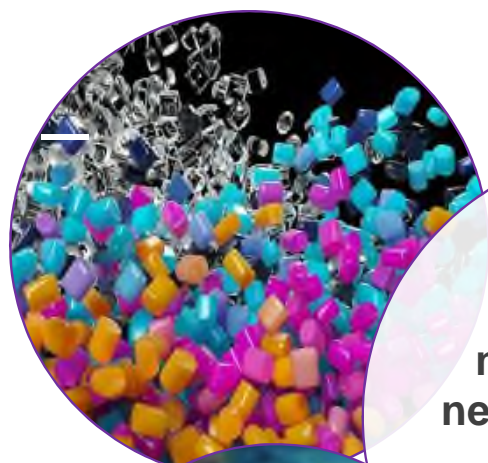
# New guiding principle

Consumption, production and value creation must change



# Crucial role of plastics

Essential to drive resource-efficient Circular Economy



**Plastics:  
more and more  
needed for climate  
neutral world**



**Plastics industry:  
crucial to promote  
transition to  
Circular Economy**

Resource-intensive  
production

Supplier of many  
key industries





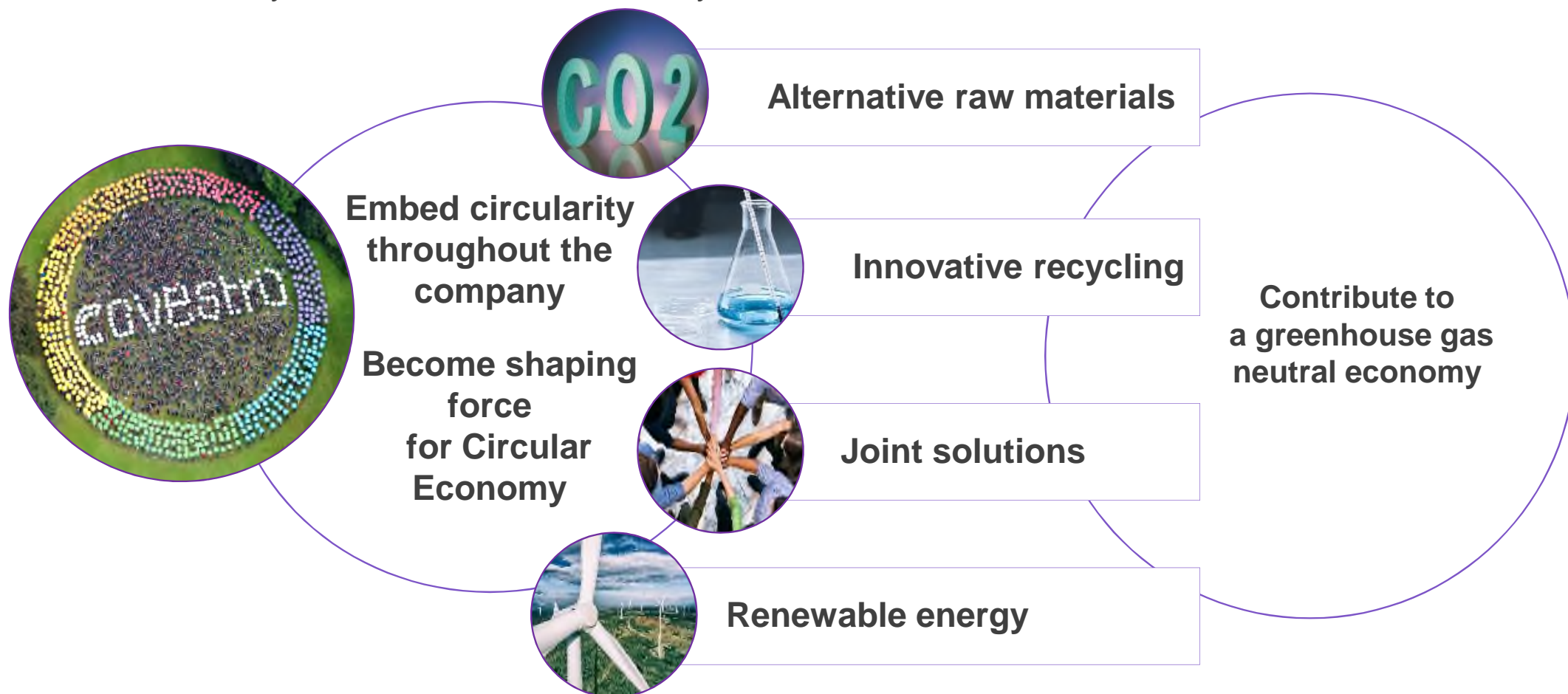
Our new **vision**

***“We will be  
fully circular”***



# Strong vision

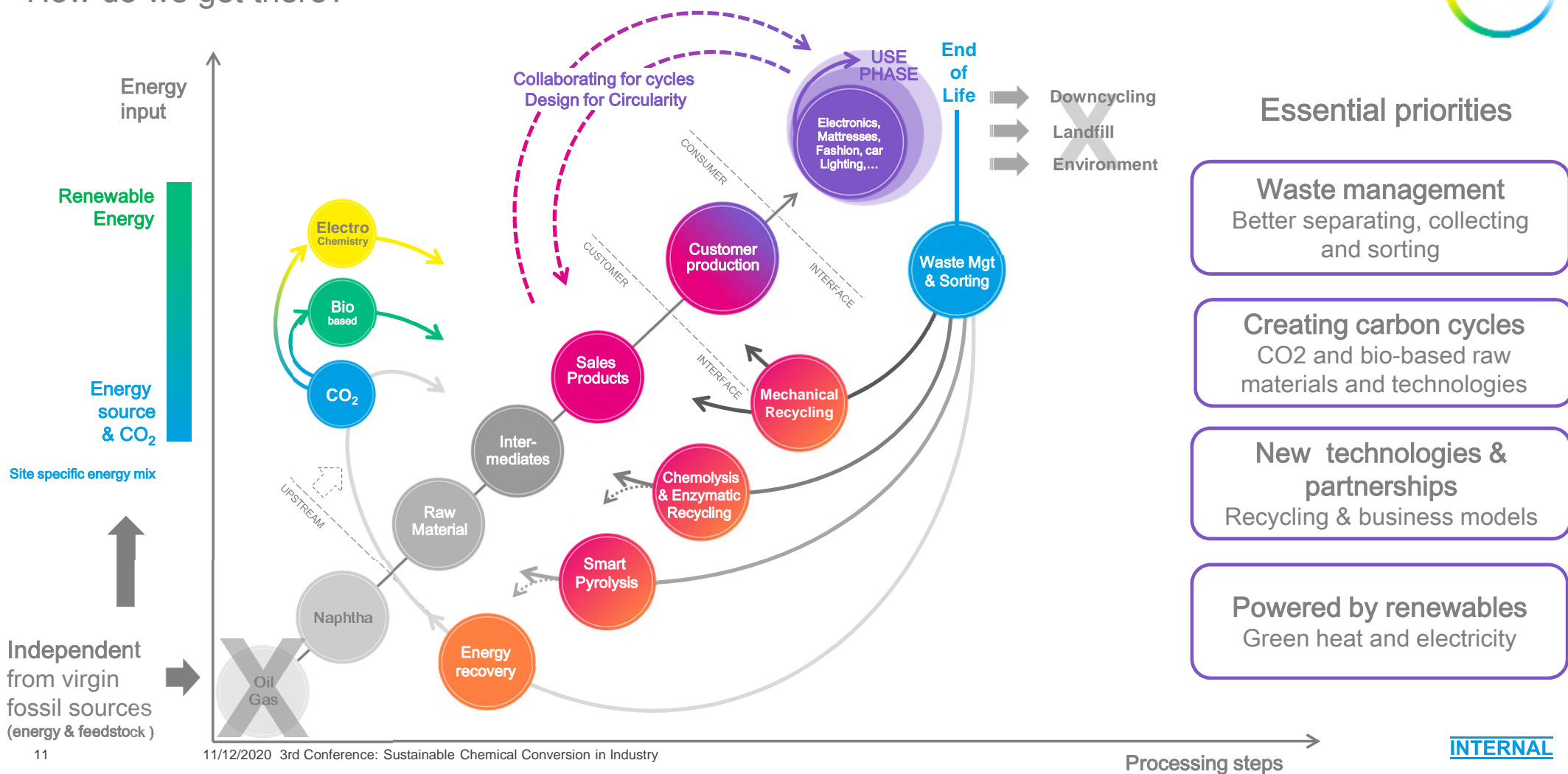
Covestro will fully embrace Circular Economy



# Covestro as driving force

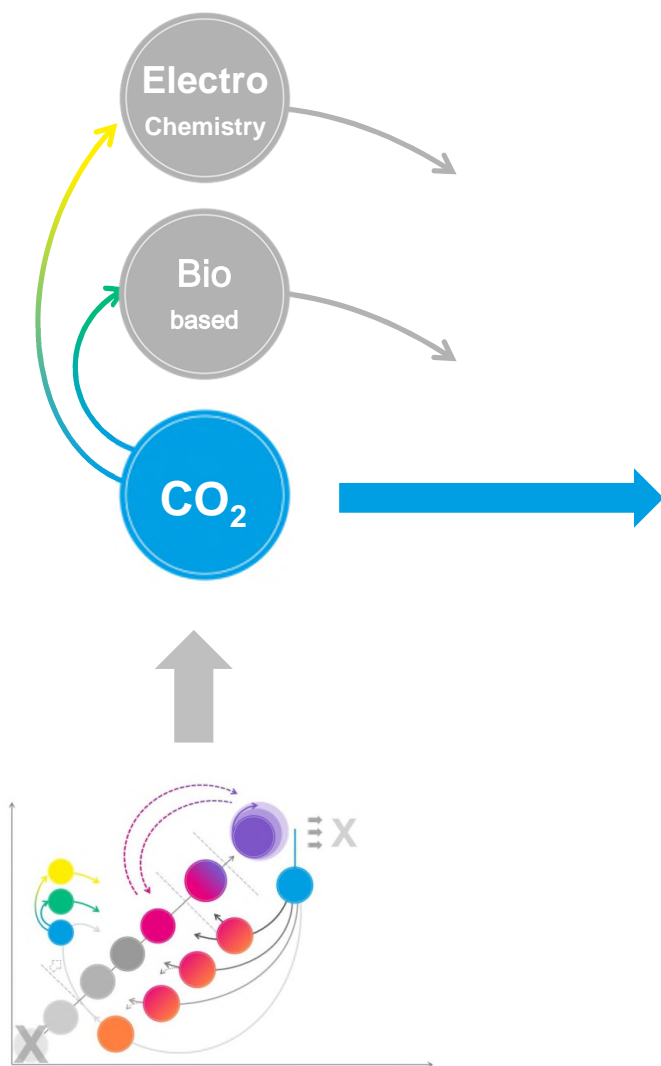


## How do we get there?

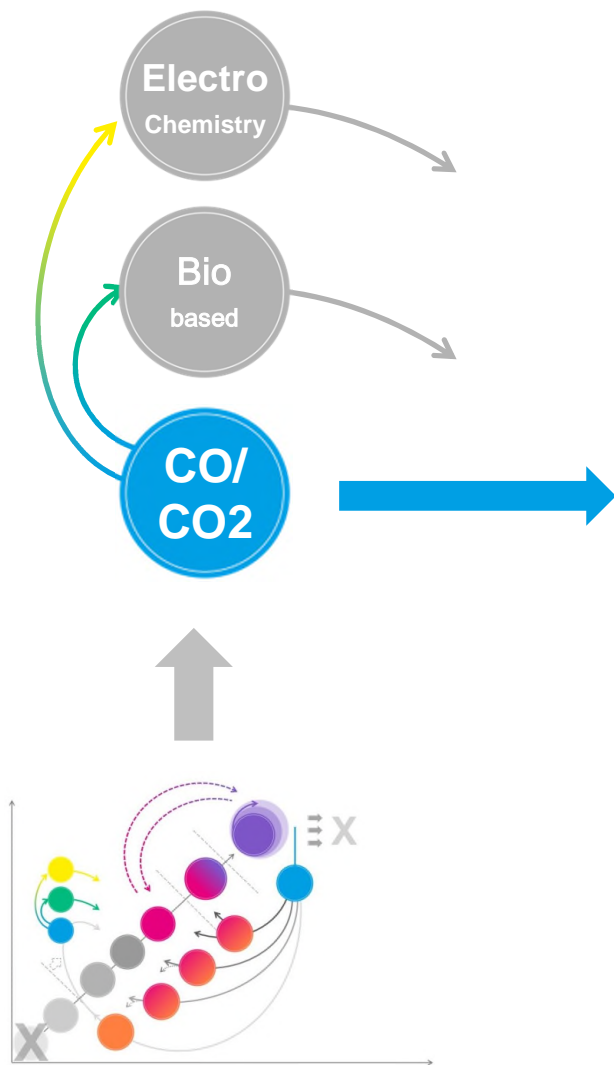


## Replacing crude oil - using CO<sub>2</sub>

- Innovative platform technology for plastic components, for foam and more
- Polyols with up to 20% of CO<sub>2</sub>
- Breakthrough in catalysis research
- Special production plant in Germany





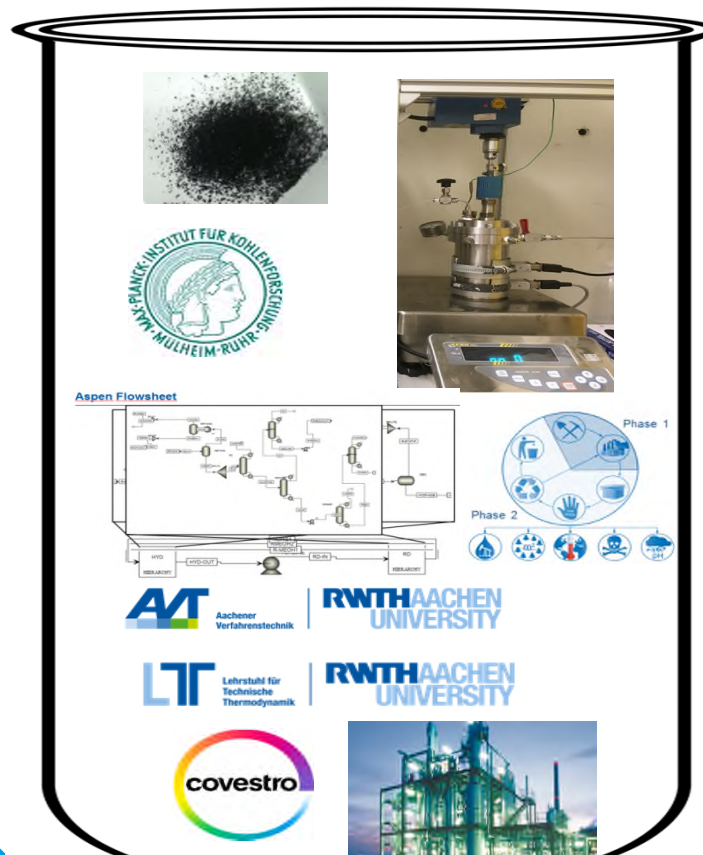


# Carbon2Chem – Carbon2Polymers

GEFÖRDERT VOM



Bundesministerium  
für Bildung  
und Forschung



Polyurethanes



Polycarbonates



continued R&D focus:

Off gas quality  
Catalysts reaction  
Reaction pathways  
Economic & sustainability



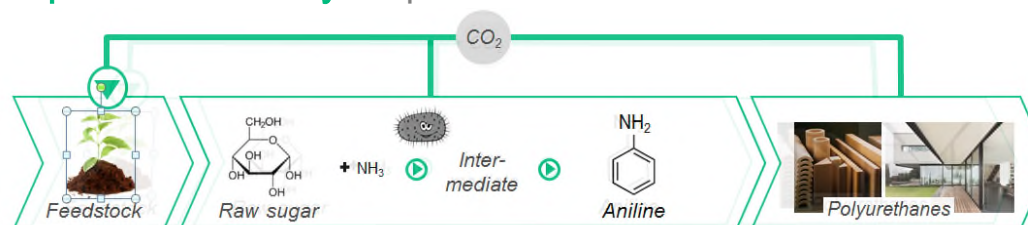
## Bio-based products: High performance enabled by nature

Thanks to a **revolutionary innovation** (pentamethylene diisocyanate - PDI), Covestro is offering a solvent-free aliphatic polyisocyanate and crosslinker (Desmodur® eco N) for **coatings, adhesives** and many more applications with around **70% renewable carbon<sup>1</sup>** content and a significantly reduced carbon footprint compared to fossil-based HDI derivatives

Covestro can produce aniline without using fossil raw materials from **unrefined sugar, e.g. from field corn, wood or straw:**

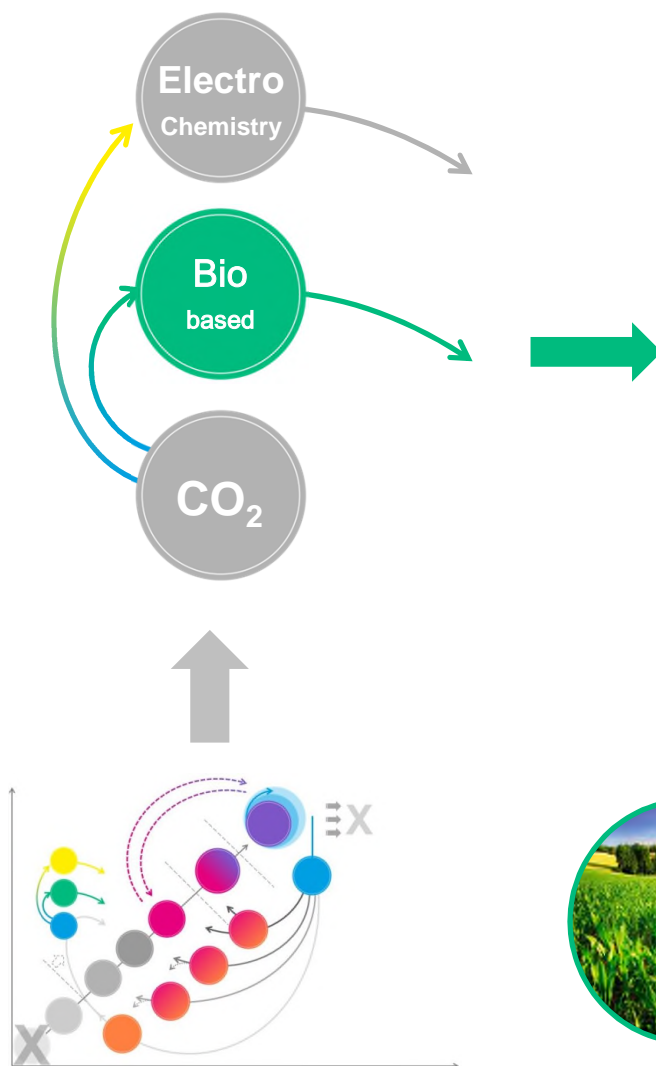
**Step 1 Biocatalysis:** sugar becomes pre-aniline through microorganism

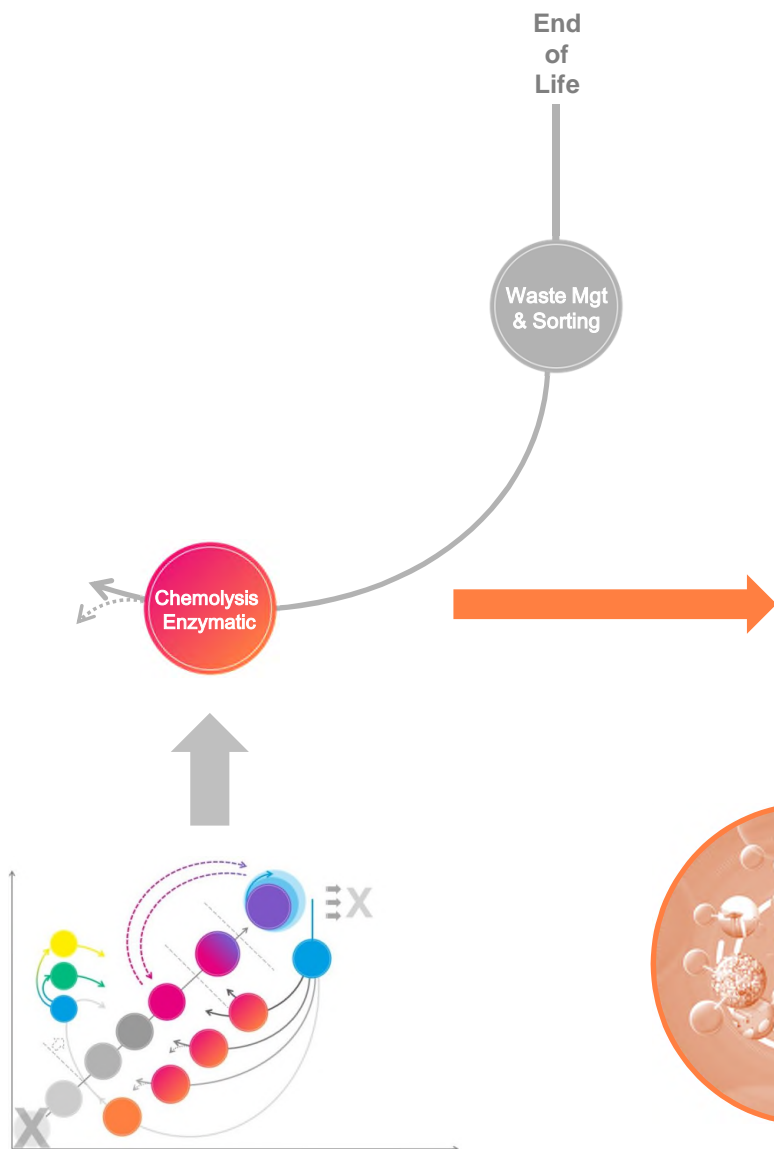
**Step 2: Chemocatalysis:** pre-aniline becomes aniline



<sup>1</sup> Renewable carbon, <sup>14</sup>C measurement according to ASTM-D6866 standard

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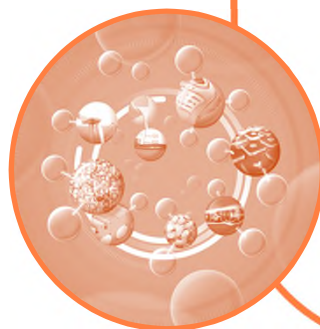


## Innovation: R&D for chemolysis and enzymatic recycling

- We break down plastic waste into its chemical building blocks (chemical intermediates or monomers). These intermediates and monomers can directly be re-used for the production of new plastics. As technologies for that we use chemolysis and enzymatic recycling.
- Chemolysis is the depolymerization of organic substances into monomers by chemical agents, usually at elevated temperatures.
- Enzymatic recycling is the selective depolymerization of organic substances into smaller molecules by enzymes, usually at mild temperatures. Enzymes are derived from nature and non-toxic catalysts that can depolymerize various polymers.

### Example:

We are strongly engaged in the EU funded PReSmart project (<https://www.puresmart.eu/>) that applies chemolysis for mattress recycling.



# Circularity entails new opportunities for business collaboration

Our invitation to the value cycle to collaboratively closing the loop



## Sharing products

Alternatives to owning products / making use of shared goods



Adaptable to industrial value cycles

**You can't share a polymer?  
Why not?**



## Digital CE Services

Enabling services for Circularity



Tracking and digital product passports to facilitate recycling

**Blockchain Integration  
#WeTrace**



## Design for Circularity

Design durable products that can be easier recycled



Recyclability at design and production phase

**Consideration of recyclability, dismantling and repairability**



## Reversed logistics & closing cycles

Better separation, collection and sorting



Only what is collected can be recycled

**Closing loops through reversed logistics**



## Carbon neutral supply

Switching to circular materials and renewable energy



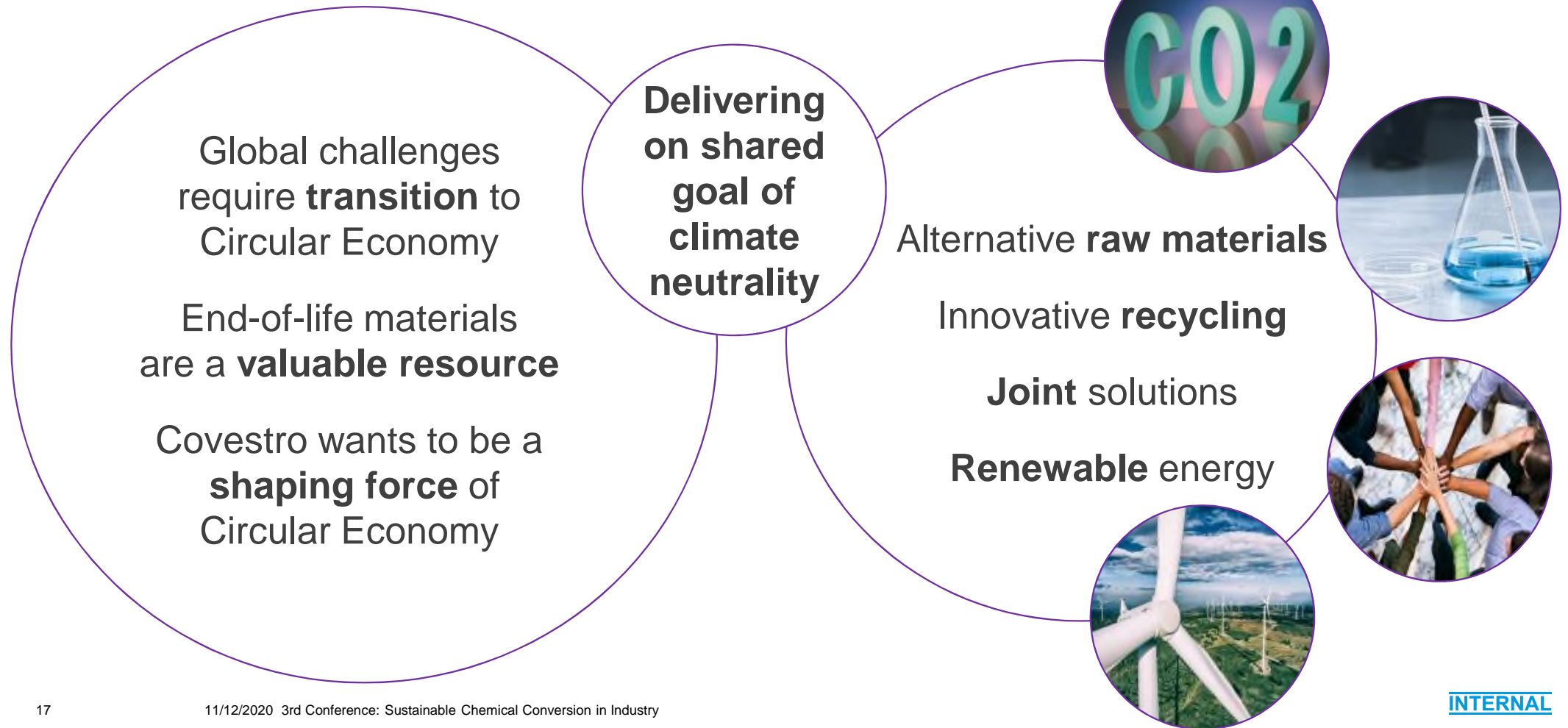
Our circular product portfolio

**Improving the environmental product performance**



# In a nutshell

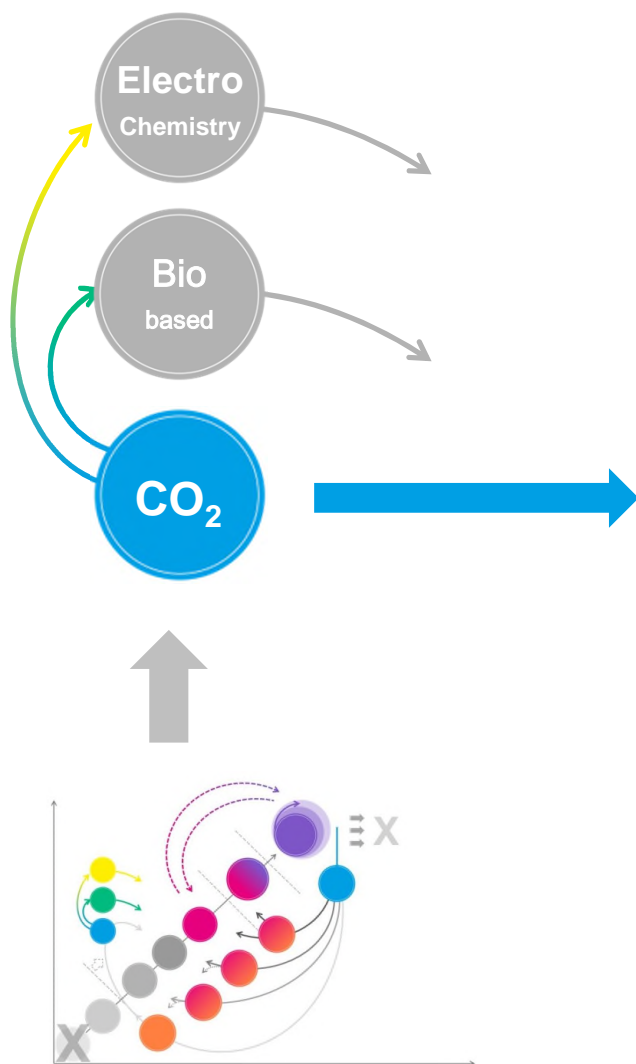
Paving the way to the Circular Economy



## Carbon2Polymers and CCU

### Frameworks required to scale up

- Consideration in EU-ETS ( Monitoring Regulation)
- Further development of LCA methodology, guidelines and standards for CCU
- Support to scale-up and demonstration plants
  - CAPEX and OPEX
  - Levy and tax reduction for R&D and demonstration activities
- CCU needs strong consideration in developing a national and EU hydrogen strategy





# Circular Economy

Key to climate neutrality  
and resource protection

Let's  
realize it  
together!

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## Forward-looking statements

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The company assumes no liability whatsoever to update these forward-looking statements or to adjust them to future events or developments.





# Thank you very much for your attention!

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