



 **BASF**

We create chemistry

Circular Economy at BASF

Overview

- The concept of Circular Economy
- BASF's understanding of Circular Economy
- Examples of BASF product portfolio contributing to Circular Economy
- Conclusion



Circular Economy gains in importance

- Since 2010, the Ellen MacArthur Foundation has given greater exposure and momentum to the concept
- European Commission has adopted the new Circular Economy Package on December 2nd 2015, entailing a general action plan as well as a legislative proposal concerning the revision of waste reduction targets

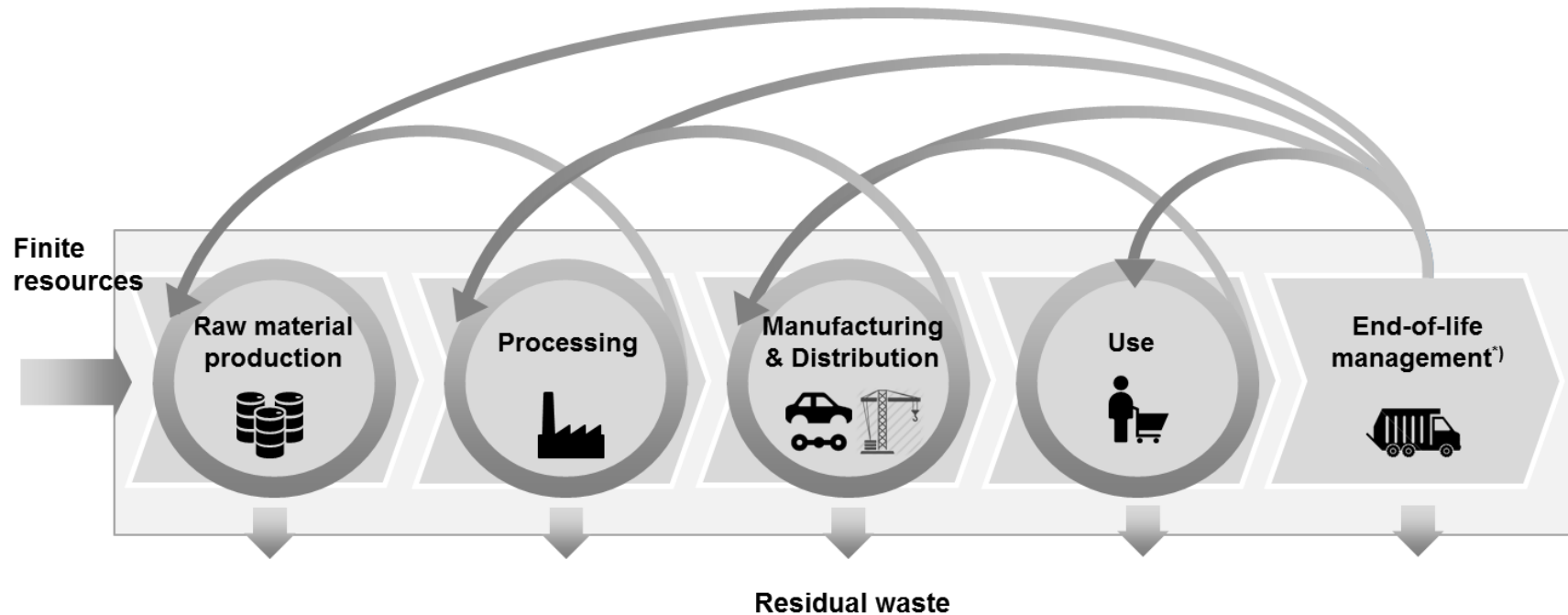
“A circular economy is a global economic model that decouples economic growth and development from the consumption of finite resources.

It is restorative by design, and aims to keep products, components and materials at their highest utility and value, at all times”.



Elements of the Circular Economy Concept

- Keep resources in use for as long as possible
- Minimize disposed residual waste
- Extract the maximum value from products
- Recover and regenerate products and materials at the end of service life



Circular Economy

Current trends in key sectors

Transportation



- Car-sharing
- E-hailing and Mobility Apps
- Autonomous driving

Agriculture



- Precision farming
- Digital supply chains and solutions for reducing consumer food waste
- Closed loops of nutrients

Construction



- Shared residential and office space
- Industrial production and 3D printing
- Tracking of materials

Circular Economy Levers

OPTIMISE



- Renewable energy and materials
- Protect health of ecosystems

REGENERATE



- Share and reuse
- Prolong life for multiple use

EXCHANGE



- Increase performance/ efficiency
- Remove waste in production

SHARE



- Recycle and remanufacture
- Extract biochemicals from organic waste

VIRTUALISE



- Virtual meetings
- E-books, music

LOOP



- Advanced non-renewable materials
- New technologies (e.g. 3D printing)

Circular Economy comprises transformative business model changes beyond waste management.

Our contribution to Circular Economy

OPTIMISE



REGENERATE



EXCHANGE



SHARE



VIRTUALISE



LOOP



KEEP IT SMART



Increase efficiency of processes and enhance effectiveness of products and solutions

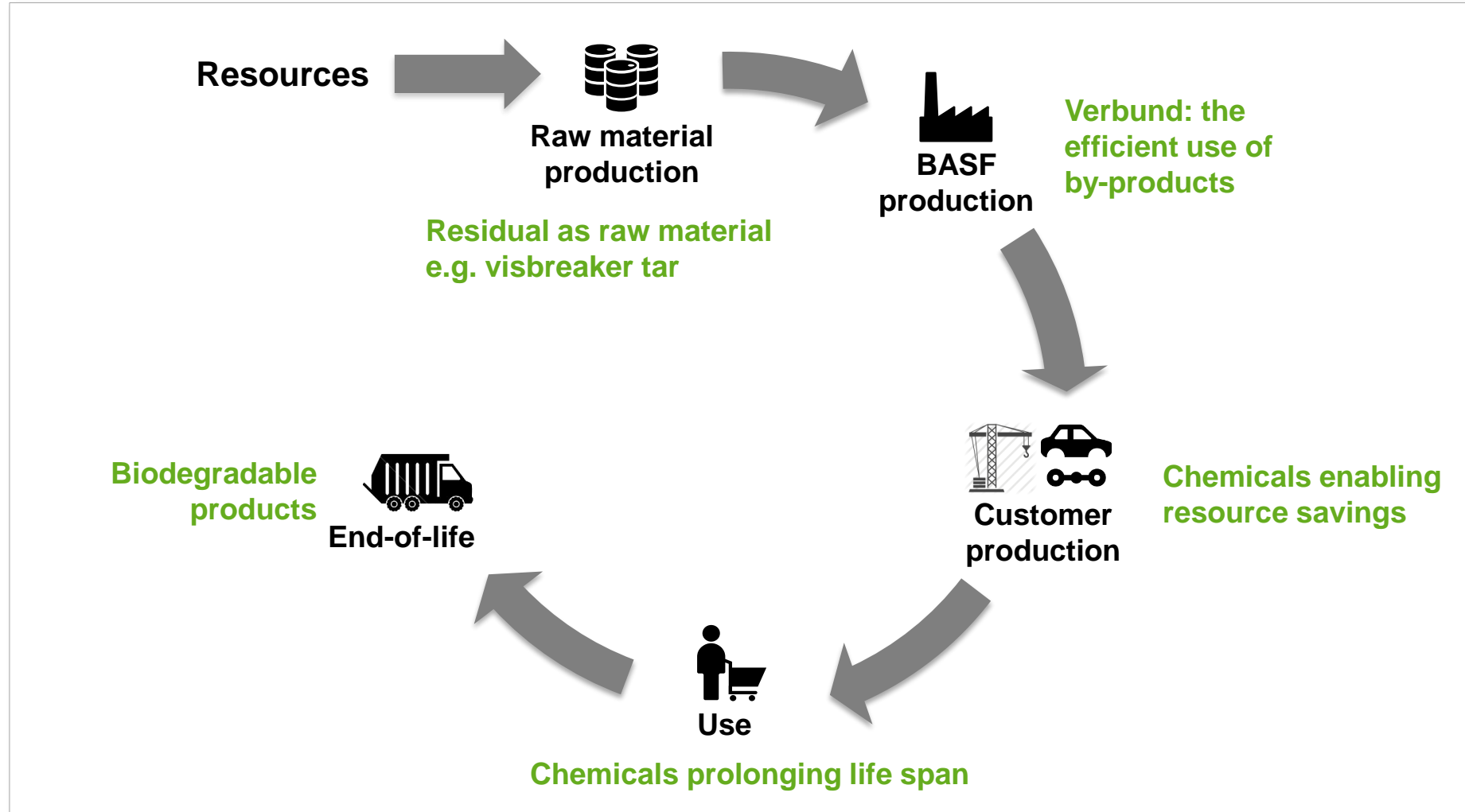
CLOSE THE LOOPS



Turn waste into resources, use natural loops

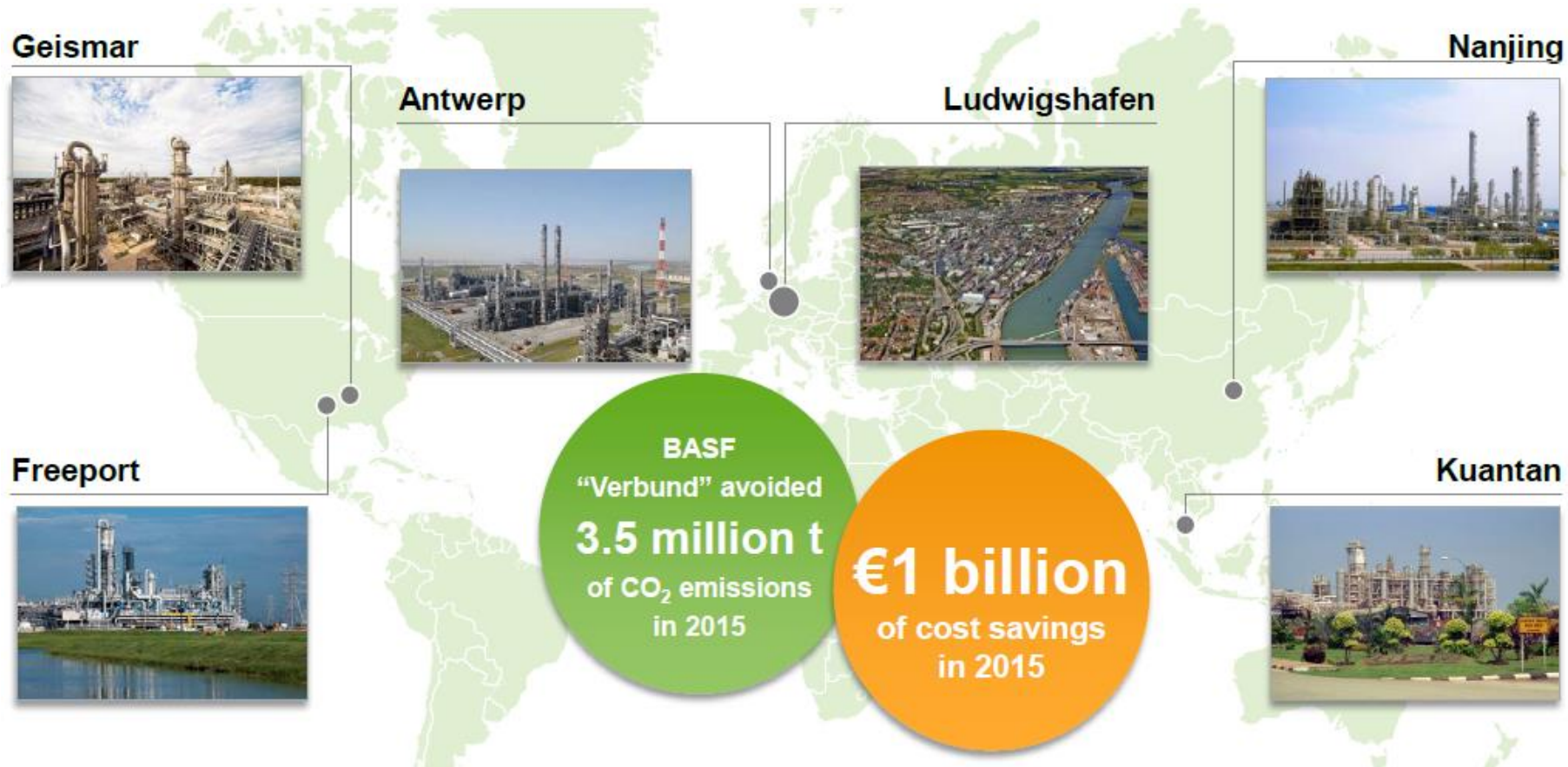
Our contribution combines the idea of smart business models with circular resource use.

KEEP IT SMART



BASF Verbund: Reduction of Emissions

Example for Optimise



Savings on resources – relief of ecosystems

SAVIVA™

Example for Optimise



Application

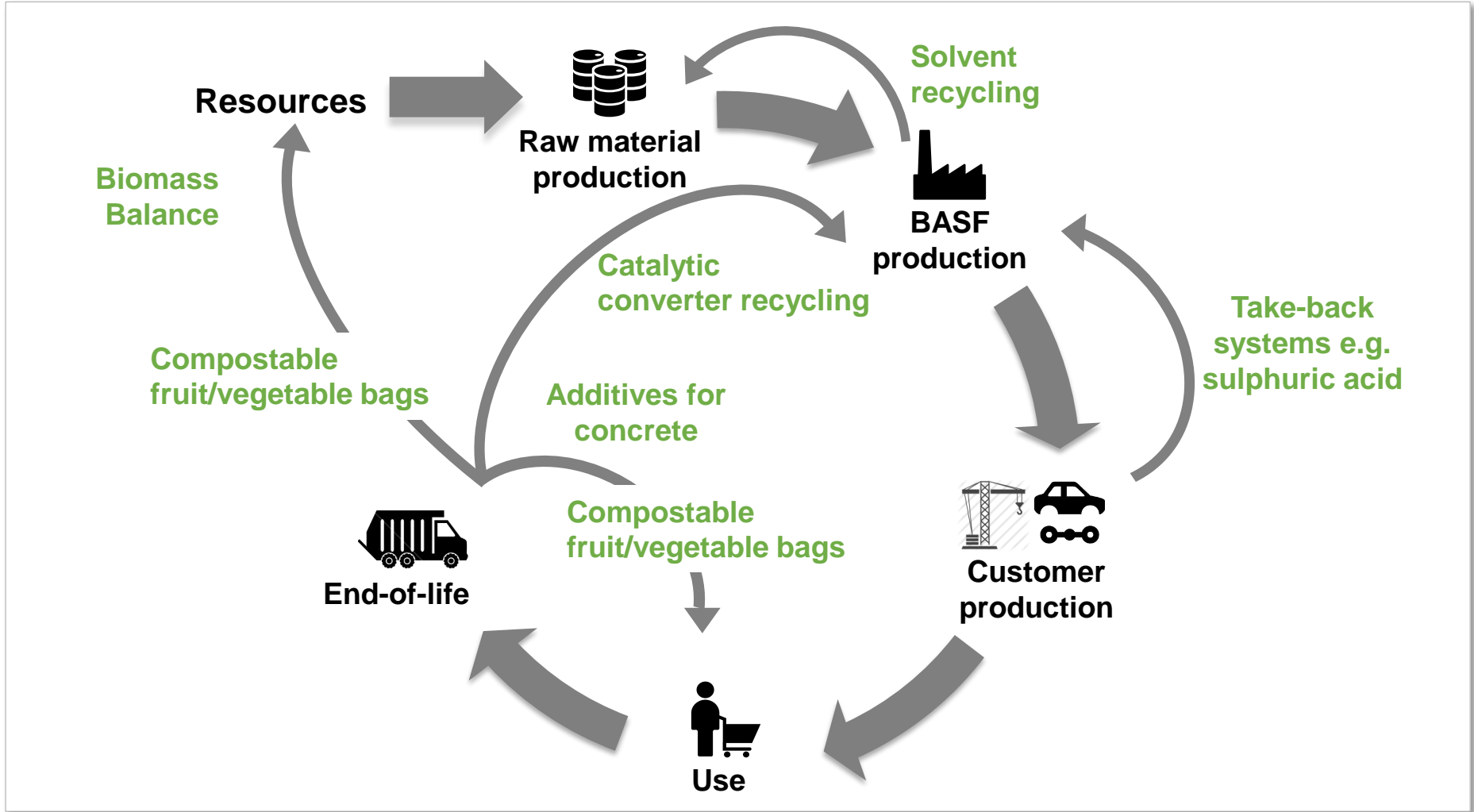
A new generation superabsorbent based on a breakthrough droplet polymerization technology with unique properties for absorbing hygiene products

CE Contribution

- Thinner diapers and improved haptic with increased comfort for end user
- Significant raw material savings (SAP and Fluff reduction) through high capacity and efficiency
- Increased dosing accuracy for waste reduction

New generation of high efficient superabsorbent polymers

CLOSE THE LOOPS



ecovio® (fruit & vegetable bags)

Example for Loop



Application

Certified home-compostable fruit & vegetable bags

CE Contribution

- Dual use: fruit & vegetable bag and organic waste bag
- Less organic waste in landfill
- More biogas potential for biogas plants
- More compost

ecovio® fruit & vegetable bags help close the loop of the food value chain.

Epotal® SP-101D

Example for Exchange



Application

Dispersion coating and printing on recycled fibers

CE Contribution

- Ensures food safe packaging
- Excellent migration barrier
- Alternative to the use of fluoro organic chemicals, PE extrusion coating and wax impregnation for oil and grease resistance
- Easily recycled

Epotal® SP-101D – Innovating solution for sustainable paper packaging.

Conclusion

- Circular Economy is much more than waste management
- Several of our implemented solutions already address the Circular Economy model
- Circular Economy brings opportunities for new business models, new solutions and, consequently, new customers
- A pre-condition is a deep understanding of the value chain and customers' needs
- Circular Economy supports value generation of high performance products
- Holistic evaluation of the sustainability of each CE business model is necessary

Combining innovation with our already established business models will generate new values.



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