

Recycling – a success story of over 40 years

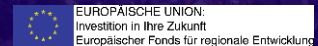
Dr. Nabila Rabanizada // REMONDIS Recycling
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**Process⁴
Sustainability**

**Cluster for climate-neutral
process industries in Hesse**

Supported by:



EUROPAISCHE UNION:
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Academic Degree:

Diploma in Mechanical Engineering, University Kassel, Institute of Materials Engineering (Plastics and Recycling Technology)

Doctorate at University BW Munich, Faculty for Aerospace Engineering, Institute of Mechanics (Prof. Alexander Lion)

Experience:

Der Grüne Punkt, Duales System Deutschland GmbH, Product and Process Development Department

- Head of application development PET
- Planning, construction of sensor panel according to automotive standard (VDA 270)
- Conformity development

Berner Kunststofftechnik GmbH/Dannemann Global Extrusion GmbH

- Quality management / Head of development

REMONDIS Recycling GmbH & Co. KG

- Head of Research and Development

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Abstract

Plastics recycling was developed at REMONDIS as early as the 1970s, out of a desire to recycle waste as sustainably as possible and to generate secondary raw materials. In 1982, we pioneered the processing of waste plastics on an industrial scale and thus became the knowledge centre for plastics recycling. Techniques for processing such as magnetic and eddy current separators were developed and optimised here together with engineers. Further processes with shredding, washing and separation technology as well as the extruder were also further developed.

Our growing expertise in all areas from waste to raw material, i.e. the collection, sorting, separation and cleaning of various plastics, has enabled us to achieve a very high-quality product that today demonstrates actual circular economy in practice. Our recycling processes are adapted in detail to each material flow and are always designed according to the motto "minimum energy input for maximum product yield".

In theory, several processes are available for the processing of plastics. The mechanical processing of the waste is always the first step for each subsequent process. Thus, solvent-based separation, depolymerisation and pyrolysis or molecule recovery can only work with specific input that has already been mechanically processed. Each additional step means further energy input and efficiency losses. For this reason, REMONDIS focuses on sustainable and high-quality processes in mechanical recycling.

The role model process here is the PET bottle cycle where it is already possible to produce bottles for food applications made from 100% post consumer waste plastic. But other polymers such as HDPE, LDPE and PP, which are very often found in packaging, are also being recycled and used in high-quality applications without any necessity of adding virgin material. Thus, a film is recycled into a film and a cosmetic bottle becomes a new cosmetic bottle. The growing interest of the packaging industry and other product segments in using recyclates in their production creates the opportunity to further invest in processes and achieve higher purities. It is crucial that we do not lose sight of the original motivation: To recycle as much material as sustainably as possible. REMONDIS - Working for the future.

REMONDIS®

WORKING FOR THE FUTURE

An aerial night photograph of a large industrial complex, likely a steel mill, with various buildings, smokestacks, and a central cooling tower. The scene is illuminated by streetlights and building lights, creating a warm glow against the dark blue twilight sky. A semi-transparent dark grey rounded rectangle is overlaid on the left side of the image, containing the text 'REMONDIS Group'.

REMONDIS Group

The service companies of the RETHMANN group: specialised services and products in four segments


REMONDIS®

WORKING FOR THE FUTURE


transdev*

**RHENUS
LOGISTICS**

SARIA®

Environmental and Industrial Services

- Recycling
- Services
- Water

Turnover 2019 in m€:	7,900
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Employees 2019:	37,000
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Transport Services

- Public transport
- Rail mass transport
- On-Demand-Transport

Turnover 2019 in m€:	7,400
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Employees 2019:	85,000
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Logistics

- Contract Logistics
- Freight Logistics
- Port Logistics

Turnover 2019 in m€:	5,500
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Employees 2019:	33,000
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Bio-Industries

- Quality products made from animal by-products
- Producer of renewable energy
- Service provider for agriculture and grocery production

Turnover 2019 in m€:	2,600
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Employees 2019:	10,500
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Company form:
family-run company

Business fields



Recycling



Services



Water



> 800

Locations across
30 countries

> 30.000

Employees



8,000

Own commercial vehicles



> 800 Plants

> 500

Locations
in all German states



> 30m t

Raw materials/year



Certified
waste management:
All sites



> 30m

People served worldwide



> 200,000

Customers from industry
& commerce

Plastic recycling in the REMONDIS Group



REMONDIS is recycling plastics for over 40 years...

1970s

"I first put the plastic waste in my washing machine to see how I could get plastic clean"
(Mr. Rethmann – REMONDIS).



1982

RE Plano: industrial size
plastics recycling facility

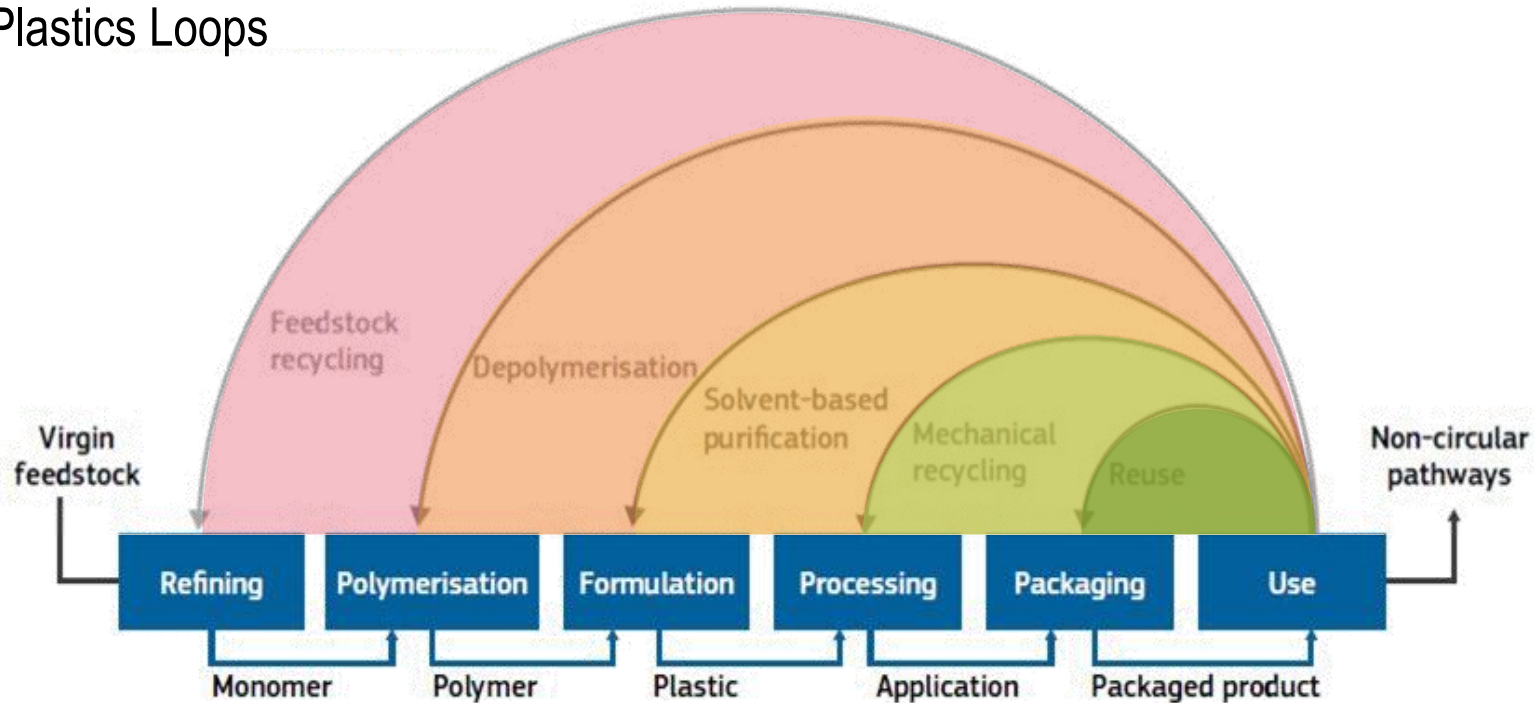
Today...

... we recycle more than 150.000 to/a of different
polymers into high quality raw materials.

The advantages of recycled raw materials



Plastics Loops



Mechanical recycling:
 Each ton of recycled plastic saves the environment 1.6 t of CO₂ and preserves nature 2 tons of crude oil

The further back in process, the more EFFORT

It looks like an industrial plant but has
the same effect as 25,000ha of forest



Circular economy: the material returns to the manufacturing process as raw material



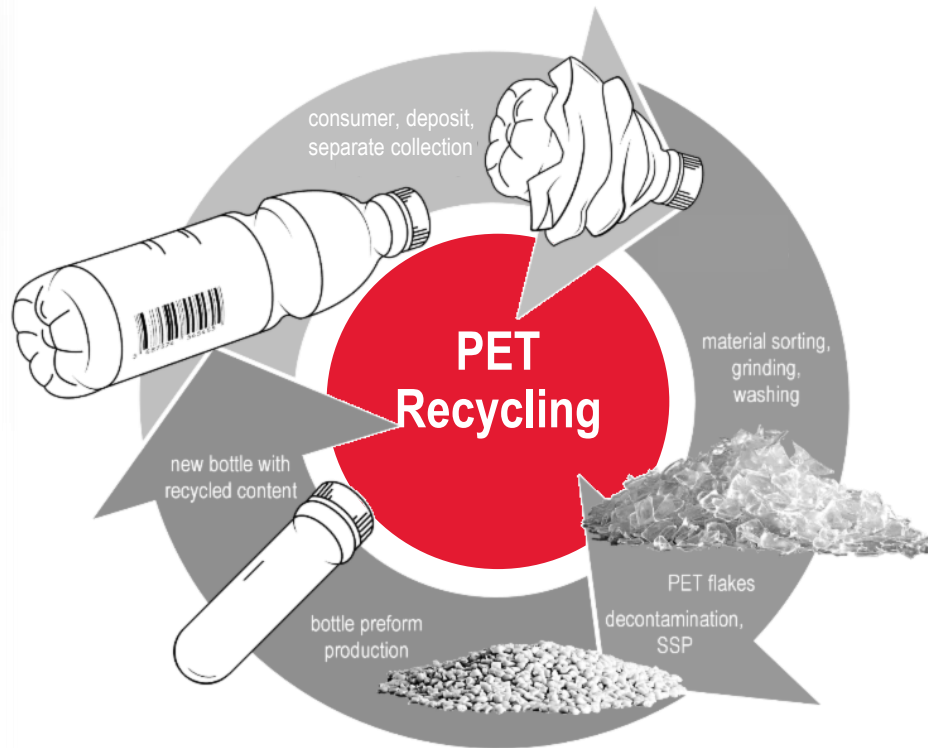
Name **Single use-PET Bottle**

Origin **Deposit Return System**

Age **19 years**

Target application **Food grade PET Bottle**

Performance **Up to 100% recycled content possible (Ø 25%)**



RE Plano

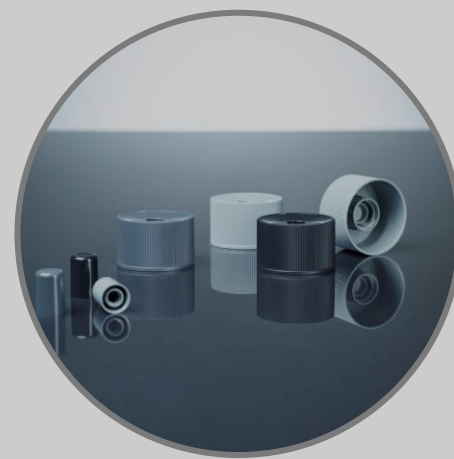
Producing recycled
polyolifines for
circular economy

Used for

- Home Care
- Baby Care
- Personal Care

Approved for

- rinse off & leave on



Circular economy – Outlook

All elements of the value chain need to contribute!

Analyze



D4R



Responsibility



Commitment




Communication



Innovation



Thank you!

A close-up photograph of two men wearing white hard hats and safety glasses, looking upwards and to the right. The man on the left has a beard and is wearing a dark suit jacket over a light blue shirt. The man on the right is clean-shaven and also wearing a dark suit jacket. The background is a bright, slightly blurred outdoor setting.

Sustainable development was on our agenda
long before it became a vote winner