

Exploring Recycled Rubber Applications with VESTENAMER®

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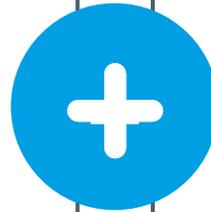
VESTARO GmbH

Joint Venture between Evonik and Forward Engineering



EVONIK is one of the world's leading specialty chemicals companies with a long expertise in developing epoxy- and polyurethane raw materials for composite applications. Evonik support their clients with tailor-made solutions from laboratory scale to serial production.

Leading Beyond Chemistry



FORWARD ENGINEERING is the competent development partner for lightweight design of composites. From idea to serial production Forward Engineering assists international clients from the automotive and engineering industry.

Automotive. Composite. Solutions.

The potential arising from the combination of **Evonik** and **Forward Engineering** as strong partners for **chemical** and **engineering know-how** is the basis for our success

The problem

End-of-life tires are a global waste problem



25 million tons end-of-life tires per year globally

Tires are valuable materials

... even beyond their primary use



**Tires' life end because
their tread is worn off ...**

**... but the remaining 90%
can still perform!**

By using VESTENAMER®*

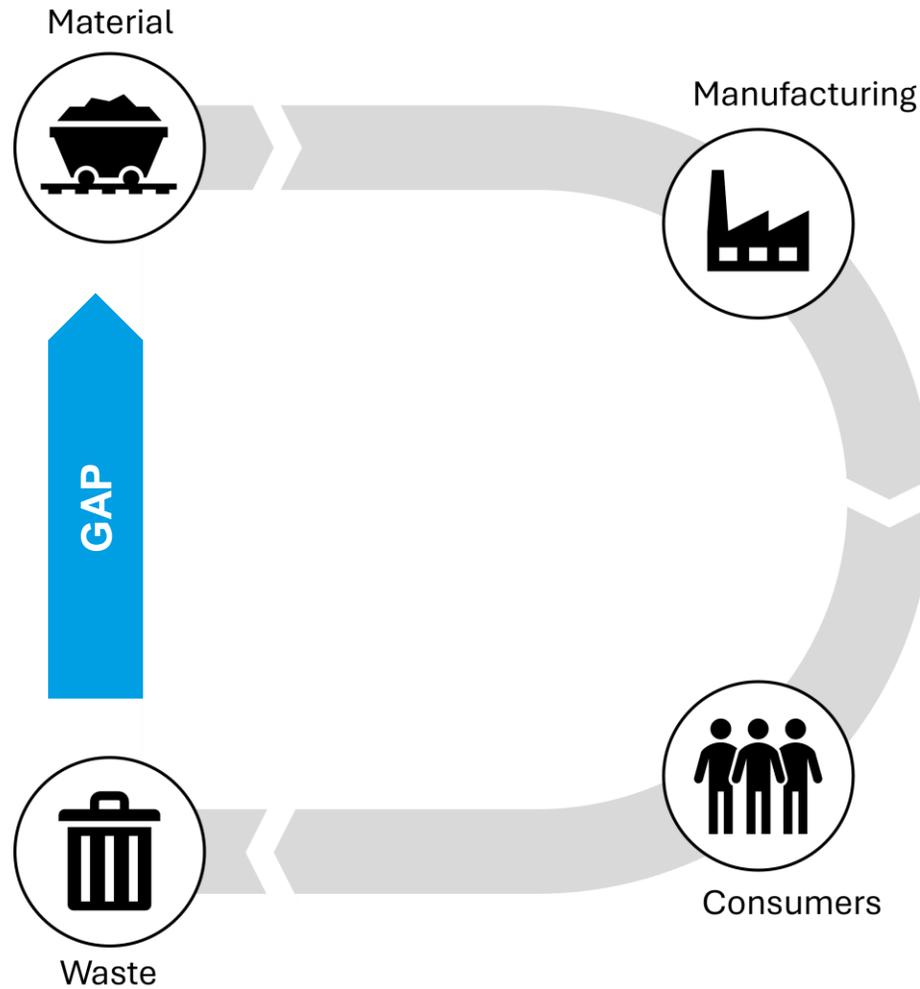
Enhance the properties of recycled rubber from tires

VESTENAMER® opens
rubber recycling to
innovation



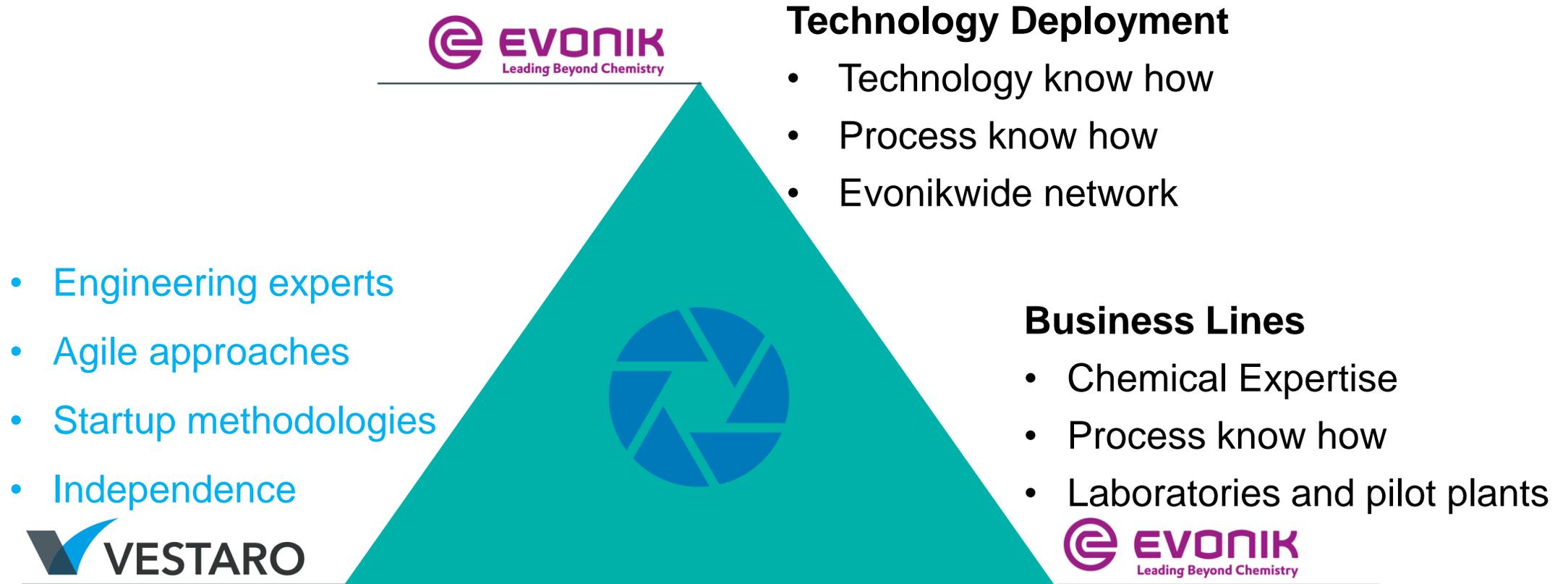
* *trans*-polyoctenamer

Today the rubber manufacturer have established processes and value chains



HOW TO OVERCOME THE GAP?

Essential for realising new Business and new Applications for Evonik is ... to work in this triad



Success with the synergies of Evonik and Vestaro

Accelerating the business with the Joint Venture



Then the right application for this new material needed to be identified

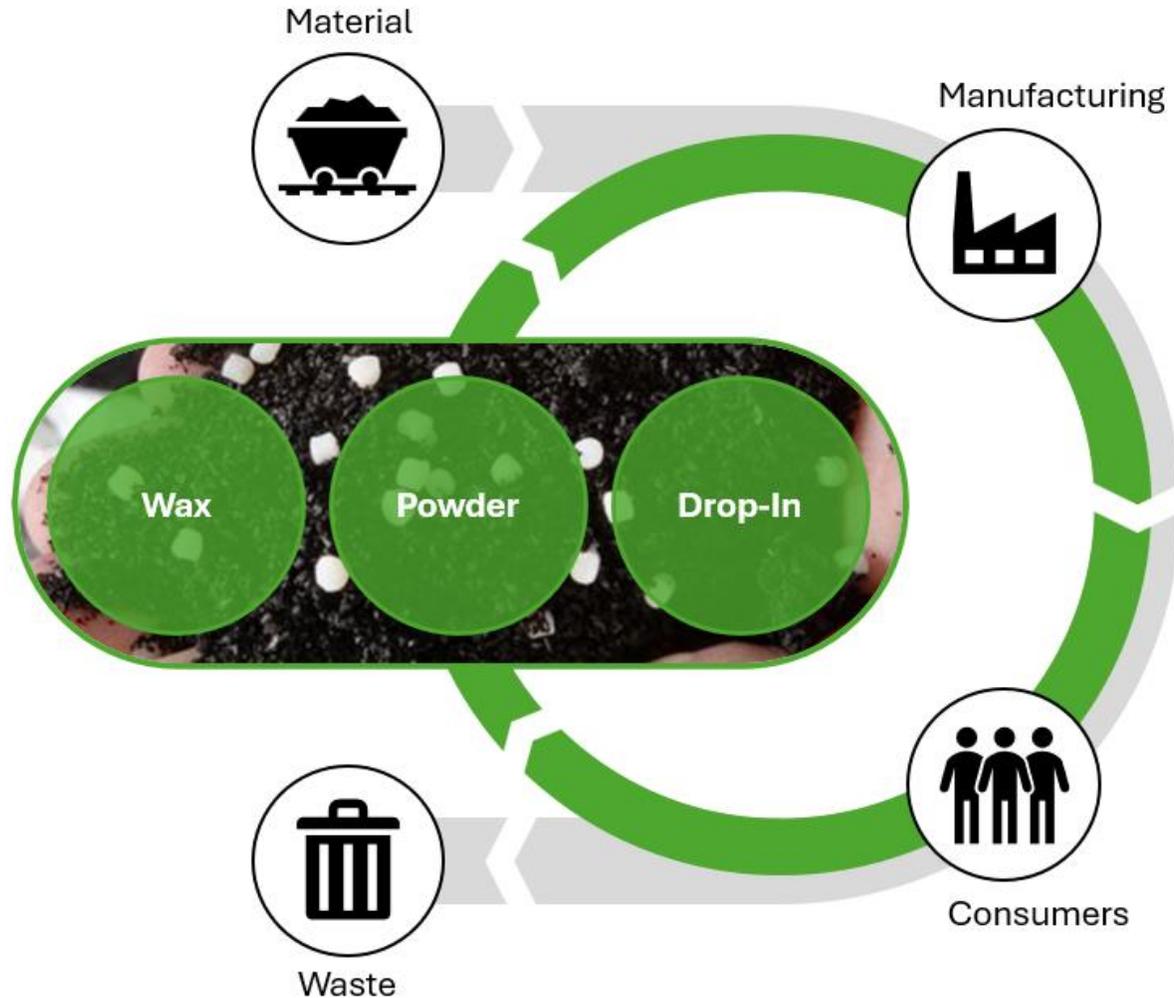
Identified via „Design Thinking“ by VESTARO



World's first tennis ball
made of recycled
rubber from tires!

A drop in solution was developed very fast with Wax and Powder

The new formulation was patented by Evonik and Vestaro

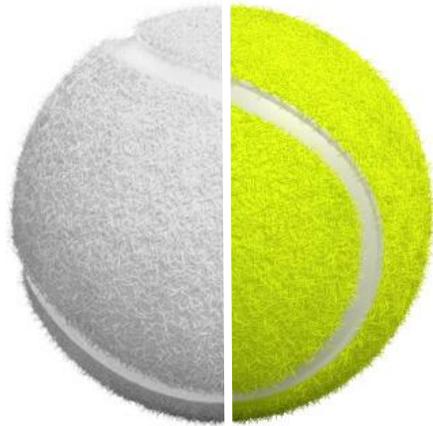


- **Material properties adapted** to product requirements
- **Delivery form adapted** to manufacturer's needs
- **Finished toolset** for fast integration and iteration at new product developments
- Potential to **reduce** both **material consumption** and **waste production** of rubber industry

Same performance – same cost ... but maximum of sustainability!

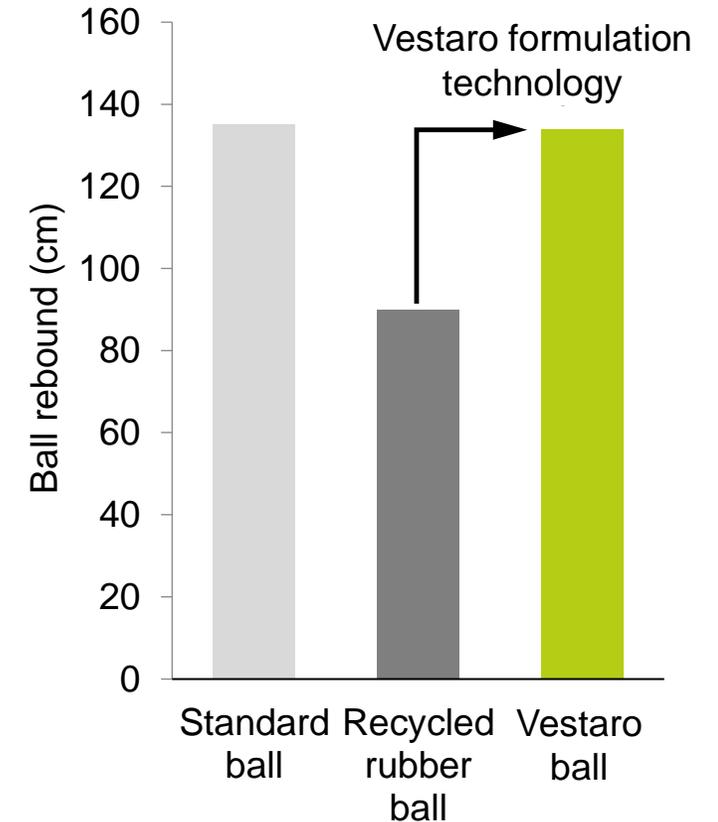
Standard ball

- Made from virgin rubber
- Energy intensive mixing



Vestaro ball

- Made from **>50% recycled rubber**
- Innovative powder mixing technology
- No compromise in costs/performance

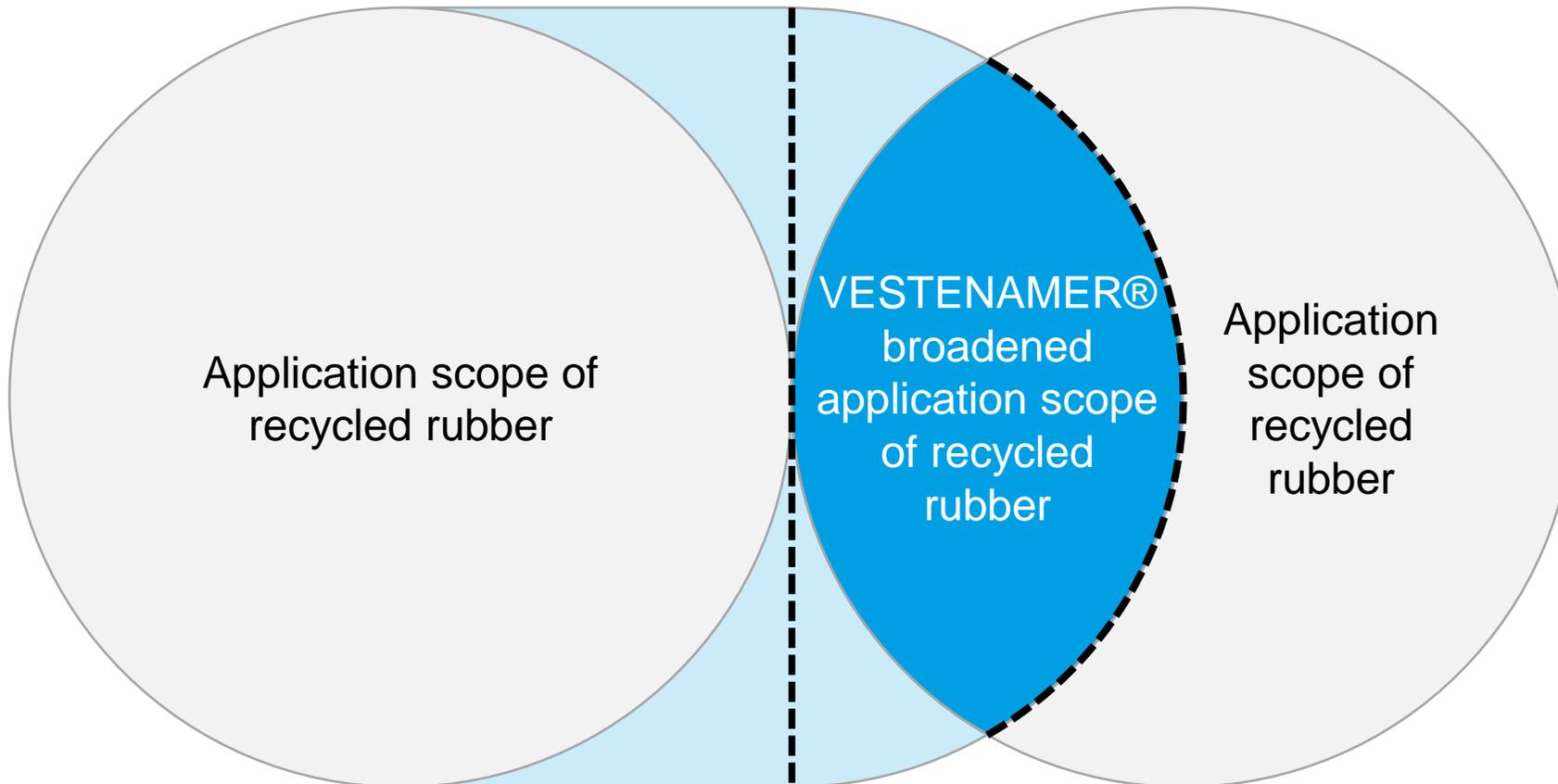


CO₂ savings and contribution to solve a global waste problem

*enabled by VESTENAMER®

Identifying the right Product-Technology-Fit and Product-Market-Fit

This is key within Evonik and Vestaro



More sustainable
Applications to come:

- Truck buffer
- Hockey puck
- Automotive parts

Why is Technology Deployment that important to this project?

Rubber-Recycling



- Contributing to solve a global waste problem



- Carbon footprint reduction
- Closing a value chain gap via a Vestaro outside Evonik



- Creation of additional value by combining technology with Evonik products

Sustainable Business

We enable sustainable growth for Evonik by technology

- Developing technical system solutions based on Evonik product VESTENAMER®
- Creating tennis ball reference
- Fostering collaboration in new eco-system together with VESTARO

