

# SMALL AMOUNT. BIG EFFECT.

**Specialty Additives**  
Division Spotlight Series 2021

July 1, 2021



# Division Spotlight Series – Specialty Additives

## Speakers of today's event



**Lauren Kjeldsen**

President of  
Specialty Additives



**Gaetano Blanda**

Head of  
Coating Additives



**Ralph Marquardt**

Head of  
Comfort & Insulation



**Stefan Plass**

Head of  
Interface & Performance

**Additive**

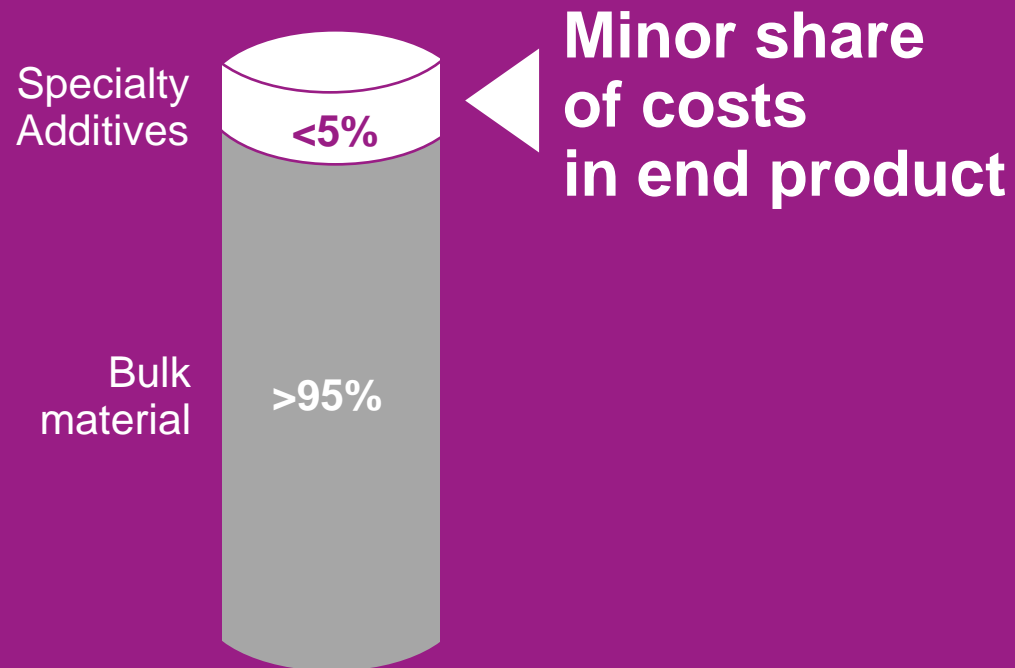
**solutions**

**WE MAKE A  
DIFFERENCE**

**for  
maximum**

**performance**

# SMALL AMOUNT.



# BIG EFFECT.

Less maintenance



Less energy



More protection



More durability



Improved product characteristics  
Improved sustainability profile



## Less maintenance



**Rust does not stand a chance**

Crosslinkers for composite-reinforced bars with outstanding mechanical and chemical properties

**15 – 35%**

reduction potential in corrosion costs (~US\$2.5 tn)



## Less energy



**Colder food & drinks for less money**

PU foam additives create performance advantages to make appliances and buildings more energy efficient

**29<sub>cent</sub>**

costs per kilowatt hour in Germany that can be avoided



## More protection



**The paint stays put**

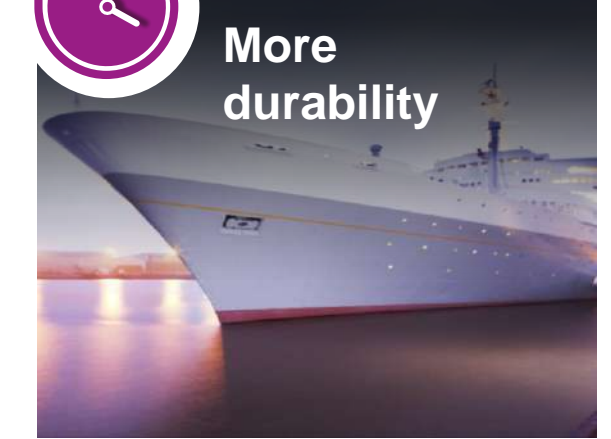
Additives for paint systems creating a lasting barrier against chemical cleaning agents

**>€30k**

avoided repainting costs for rail car surfaces



## More durability

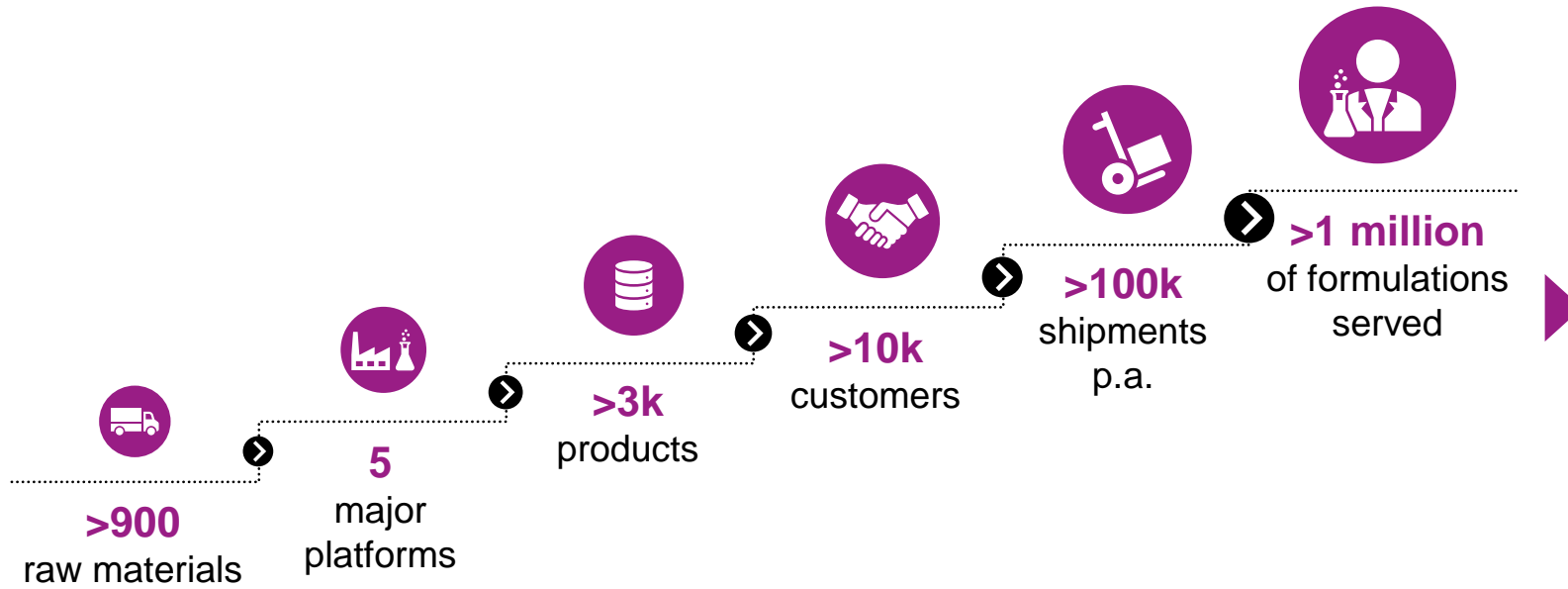


**Solutions against biofouling**

Hydrophilic AEROSIL® improves anti-fouling coatings for ship hulls

up to **30%**

decreasing fuel consumption



**High barriers to entry**  
**Resilient financial performance**  
**Strong market & customer position**

**Mastering complexity**

<b>How?</b>	<b>1</b> Experienced management team	<b>2</b> Digitalization & automation
	<b>3</b> Culture & collaboration	<b>4</b> Supply chain excellence

**Tangible benefits**

2020



16%  
ROCE



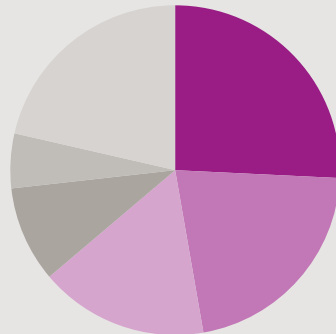
27%  
EBITDA MARGIN



>3,500  
EMPLOYEES



48  
NATIONALITIES



- Mobility
- Construction
- Consumer Goods
- Coatings
- Environmental
- Other



Additives for coatings and inks



Additives for polyurethane foam



Specialty defoamers and wetting agents



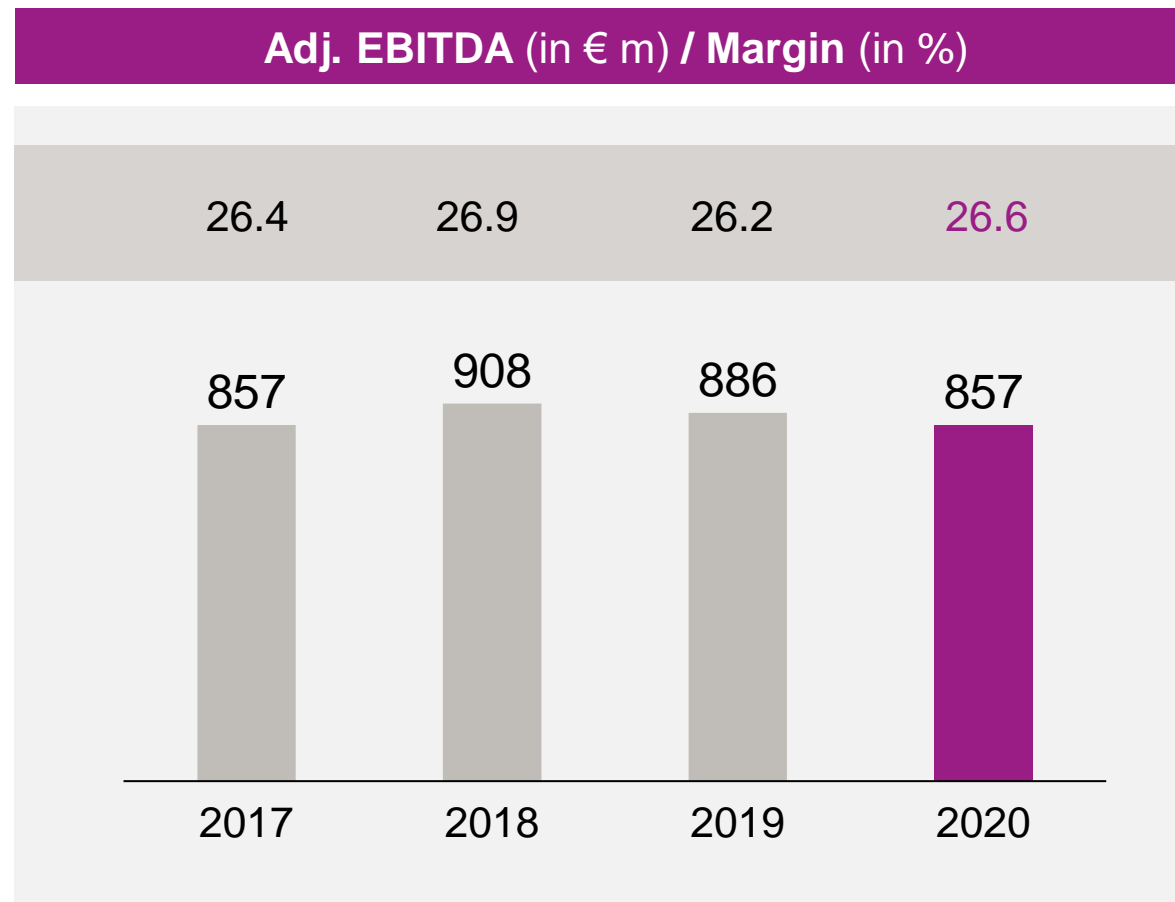
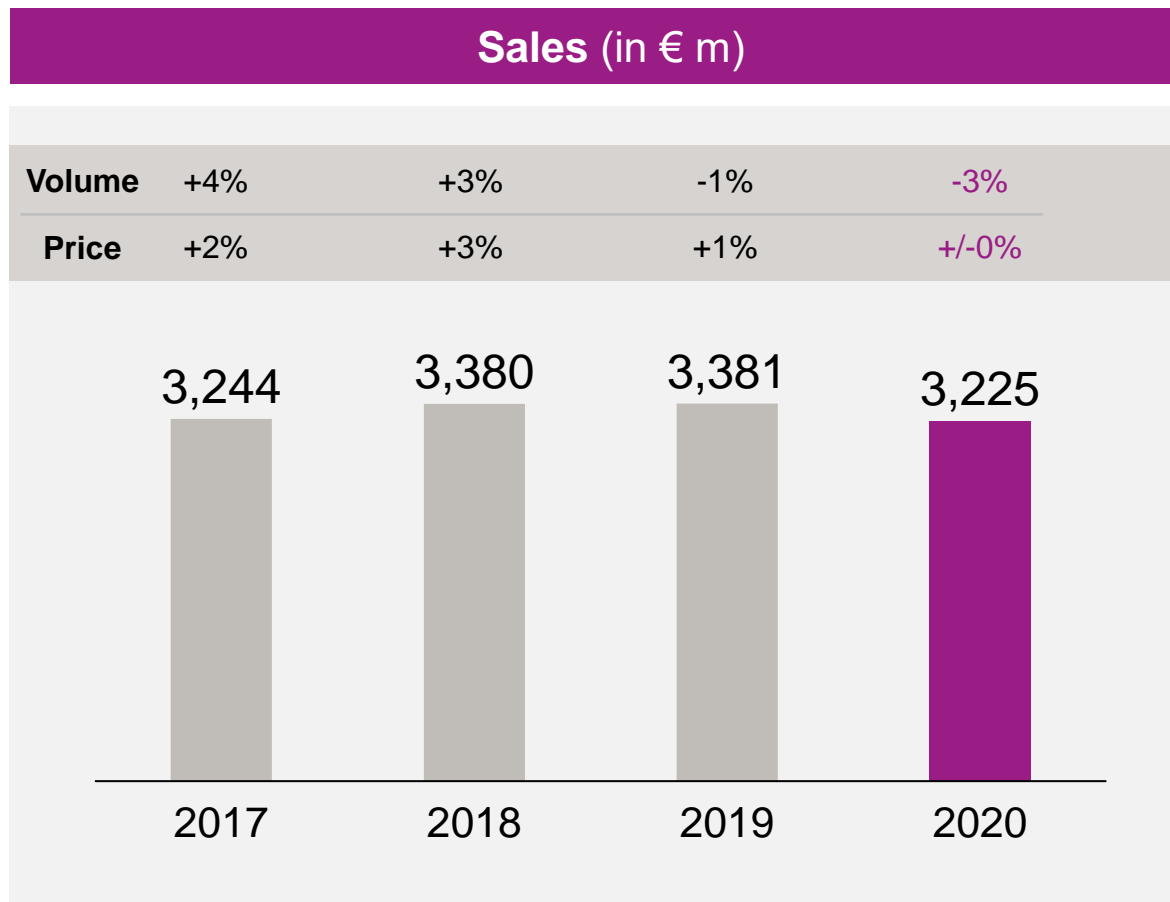
Epoxy hardeners for crosslinkers



Lubricant additives






# Specialty Additives business model is highly resilient

## Demonstrated by financial performance over the years





# Specialty Additives enables their customers to benefit from fundamental end market trends

<b>Mobility</b>		Increasing mobility paired with electrification Performance and circularity in materials	➤	PU foam additives for battery protection	Emerging solutions for recycling
<b>Construction</b>		Continued urbanization and construction efficiency Highly insulated energy efficient buildings	➤	Concrete additives	Additives for PU spray foam insulation
<b>Consumer goods</b>		Increasing comfort and individualization Low footprint clothes and appliances	➤	Bedding & seating foam additives	Additives for artificial leather
<b>Coatings</b>		Durability and protection with reduced footprint Functionalizing coatings	➤	Additives to prolong life of paints	Marine coatings to protect ship hulls
<b>Environmental</b>		Accelerating wind and solar power production Increasing farming efficiency & reducing fertilization	➤	Crosslinkers for durable wind turbine blades	Wetting agents for crop & seed protection

# Growth opportunities driven by sustainability and digitalization

Deep dives today



**Key growth driver: Sustainability**

**Enabler: Digitalization**

# Specialty Additives Play

## Sitting at the table



**Building #1 position in customer relevance**

to be decisive part of their innovation agenda and product offering

## Ability to assess



**Understanding our customers' value chains and markets to create the ideal solution**

## Rapid tailored innovation



**Delivering continuously new solutions** for markets and customers

## Mastering complexity



**Broad spectrum of tailored product** for numerous customers

# MAKING THE DIFFERENCE

**Specialty Additives**  
Division Spotlight Series 2021

Stefan Plass, Head of Interface & Performance  
Gaetano Blanda, Head of Coating Additives



# ADDITIVE SOLUTIONS FOR MAXIMUM PERFORMANCE



Our products & solutions  
make the difference with ...

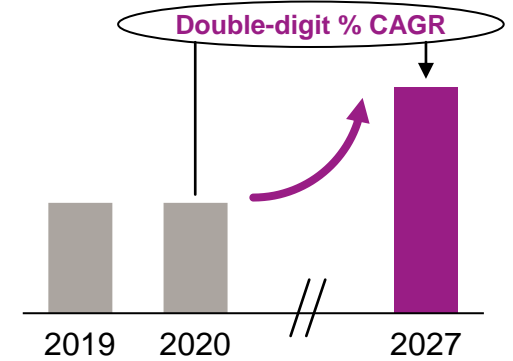
... improved  
product  
performance



... an improved  
sustainability  
profile



# Our products enhance lifetime and enable recycling of construction materials to mitigate resource limitations and regulatory pressure



- Urbanization drives construction growth and rise in material use
- Modern architecture drives demand for high-performance materials
- **Environmental impact from resource limitations and regulatory pressure**

- Additives and formulation know-how e.g. for **dispersing agents that enable**
  - durability by improving resistance of cementitious building materials
  - more environmentally friendly formulations
  - better workability of materials

- Relevant market of ~€800 m in valuable niches
- Growth opportunities from new solutions like “self-healing” concrete

# Our products enhance performance of conventional and biological plant protection to serve a growing global population



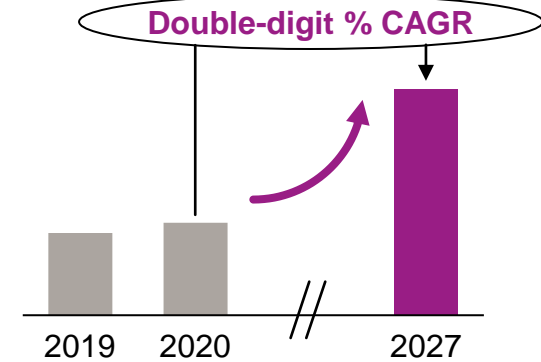
## Challenge



## Solution



## Sales potential (in € m)

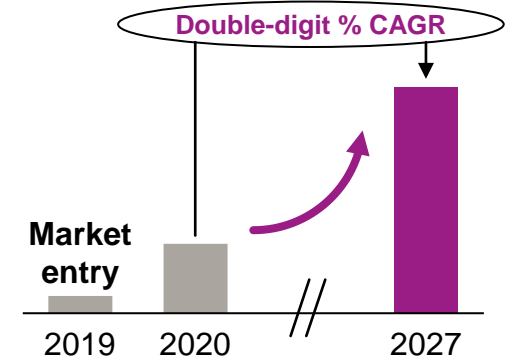
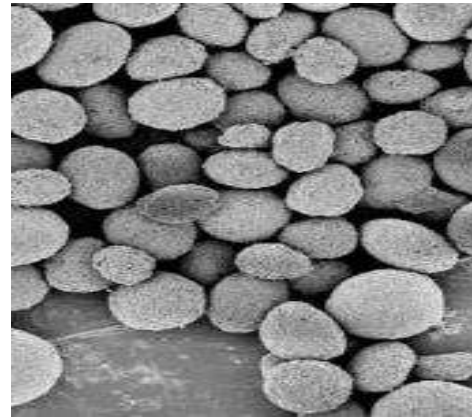


- Growing population drives rising demand for healthy food
- **Limited arable land**

- Additives like **wetting agents** deliver interfacial science to enable targeted crop protection application
- Expanded portfolio to extend shelf life for bio-solutions and seed treatment

- Relevant market of ~€400 m in highly attractive niches
- **Growth acceleration through increased focus on innovation (esp. bio-solutions) and geographic expansion**

# Our specialty fillers significantly increase burnish resistance and prolong life of medium- to low-gloss paints



- Colored wall paints with medium- to low-gloss levels are susceptible for burnishing (through abrasive forces or polishing of the surface)
- **Damaged surfaces have uneven gloss levels and look unappealing**

- SPHERILEX® specialty fillers (silica spheres) with a unique shape and narrow particle size distribution



Superior burnish & wet scrub resistance



Easy-to-formulate, low impact on binder demand

- Global market for silica spheres and competing technologies is >€1 bn per year
- **Clear USP and capacity expansion projects drive future sales growth**



# Our coating additive technologies enable effective and safe microbial control



# ENABLING CIRCULAR ECONOMY

**Specialty Additives**  
Division Spotlight Series 2021

Ralph Marquardt, Head of Comfort & Insulation  
Stefan Plass, Head of Interface & Performance

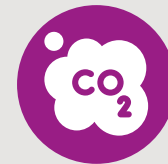


# DECOUPLING GROWTH FROM RESOURCE CONSUMPTION



Our products &  
solutions enable ...

... reduced  
emissions  
and material  
consumption



... mechanical  
and chemical  
recycling



# Circular Economy – Important governmental and international initiatives target reduction of waste and use of renewable raw materials



EU Green Deal drives the Circular Economy Action Plan



China 14<sup>th</sup> 5-year plan key technologies/industrial: ... Circular economy & recycling management ...



Community of leaders (CEOs and ministers): Committed to creating a circular economy



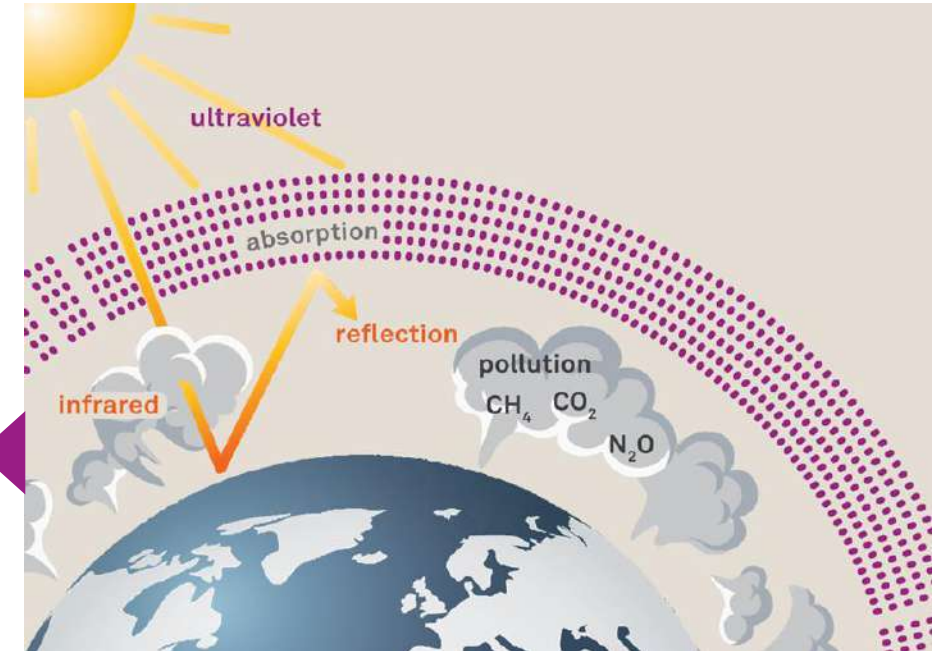
President Biden's Leaders Summit on Climate: ... advancing the circular carbon economy approach ...

# The PU industry is introducing novel blowing agents with low global warming potential (GWP)



- **Improved insulation** is key for CO<sub>2</sub> reduction
- **Spray foam** allows efficient insulation of buildings
- Spray foam systems require **blowing agents**

Introduction  
4<sup>th</sup> generation  
blowing agents  
with low GWP



- Blowing agents: **Halogenated hydrocarbons**
- 1<sup>st</sup> and 2<sup>nd</sup> generation already phased out
- 3<sup>rd</sup> generation with high global warming potential

# Novel Evonik PU additives enable the use of environmentally friendly blowing agents in spray foam



## Challenge

- New, 4<sup>th</sup> generation blowing agents with low GWP needed
- But: these tend to decompose in pre-formulated PU systems, hence limiting shelf life
- **Novel PU additives required to guarantee storage stability and ensure consistent application performance**



## Solution

- Evonik POLYCAT<sup>®</sup> 203 – 206: new additives with key advantages
  - **Good compatibility with 4<sup>th</sup> generation blowing agents**
  - **Enabling prolonged storage stability**
  - **Low emissions in use**

1: Source: IAL and Evonik internal market studies

## PU construction market growth rates (CAGR '21 – 27)<sup>1</sup>

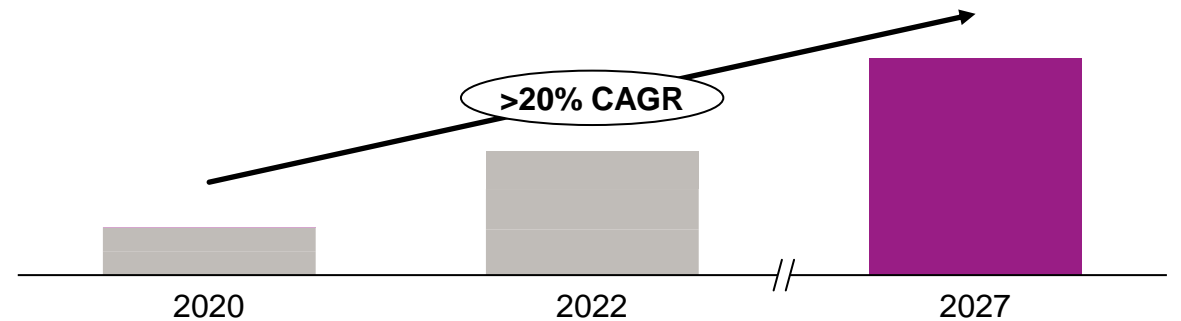


Construction total



Spray foam submarket

## Sales potential (in € m)



# Evonik additives are essential for emerging environmentally friendly artificial leather production at high quality



## Challenge

- Increasing demand to replace genuine leather by artificial leather
- Existing process for artificial leather production is solvent-based and thus of environmental concern
- Environmentally friendly water-based technology with lower quality leather surface

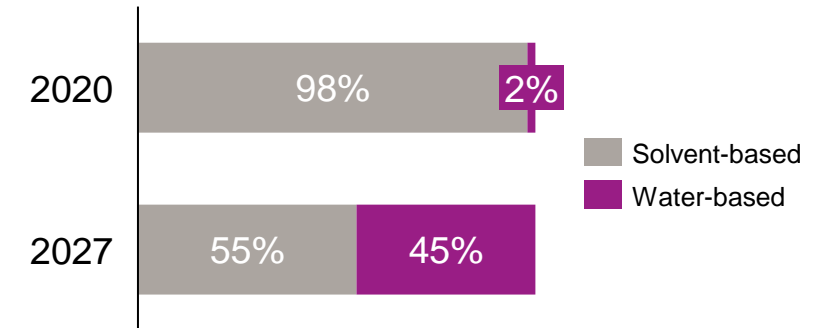


## Solution

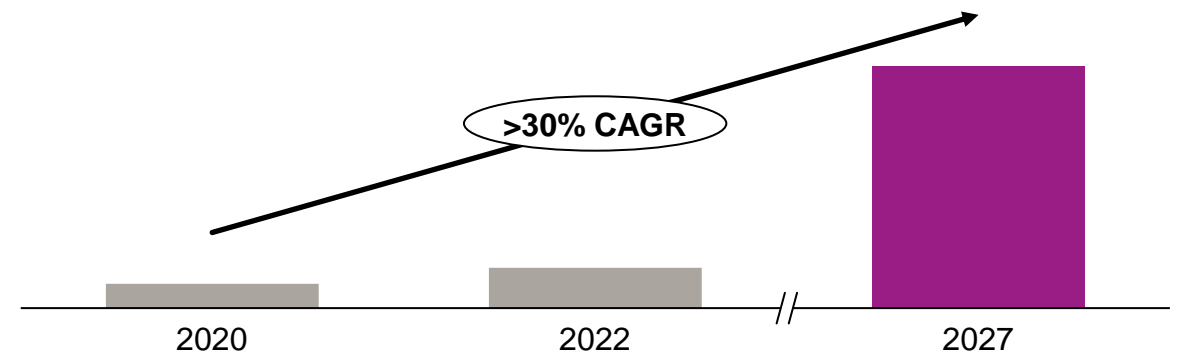
- New ORTEGOL® P series: Novel foam stabilizers for water-based PU artificial leather production
  - Enable production of high-quality artificial leather (vegan)
  - Environmentally friendly solution

1: Source: IAL and Evonik internal market studies

## Artificial leather market development<sup>1</sup>



## Sales potential (in € m)



# Linerless labels have significant sustainability benefits with up to 40% reduced material usage



## Challenge

- Every day >275m parcels are delivered, consuming 4.3m m<sup>2</sup> labels
- Liner make up up to 40% of the weight of traditional labels
- **Causing unnecessary waste, emissions, material and logistics costs**

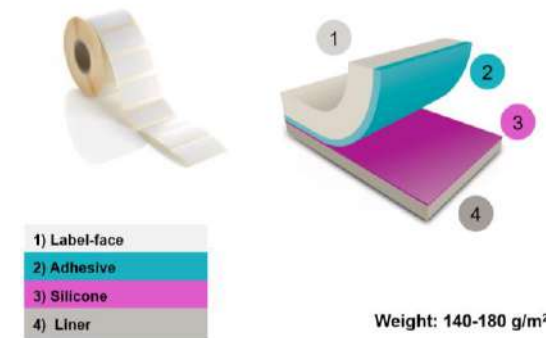


## Solution

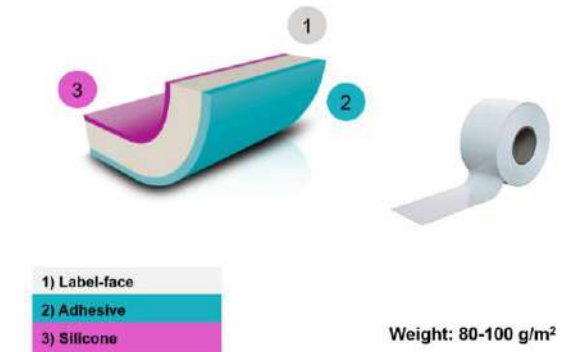
- A silicone coating ensures that the windings separate cleanly and quickly before dispensing the individual label
- **Linerless labels can save ~75 kg of CO<sub>2</sub> per 1,000 m<sup>2</sup> of label**
- More efficient logistics and handling



### Standard Label



### Linerless Label



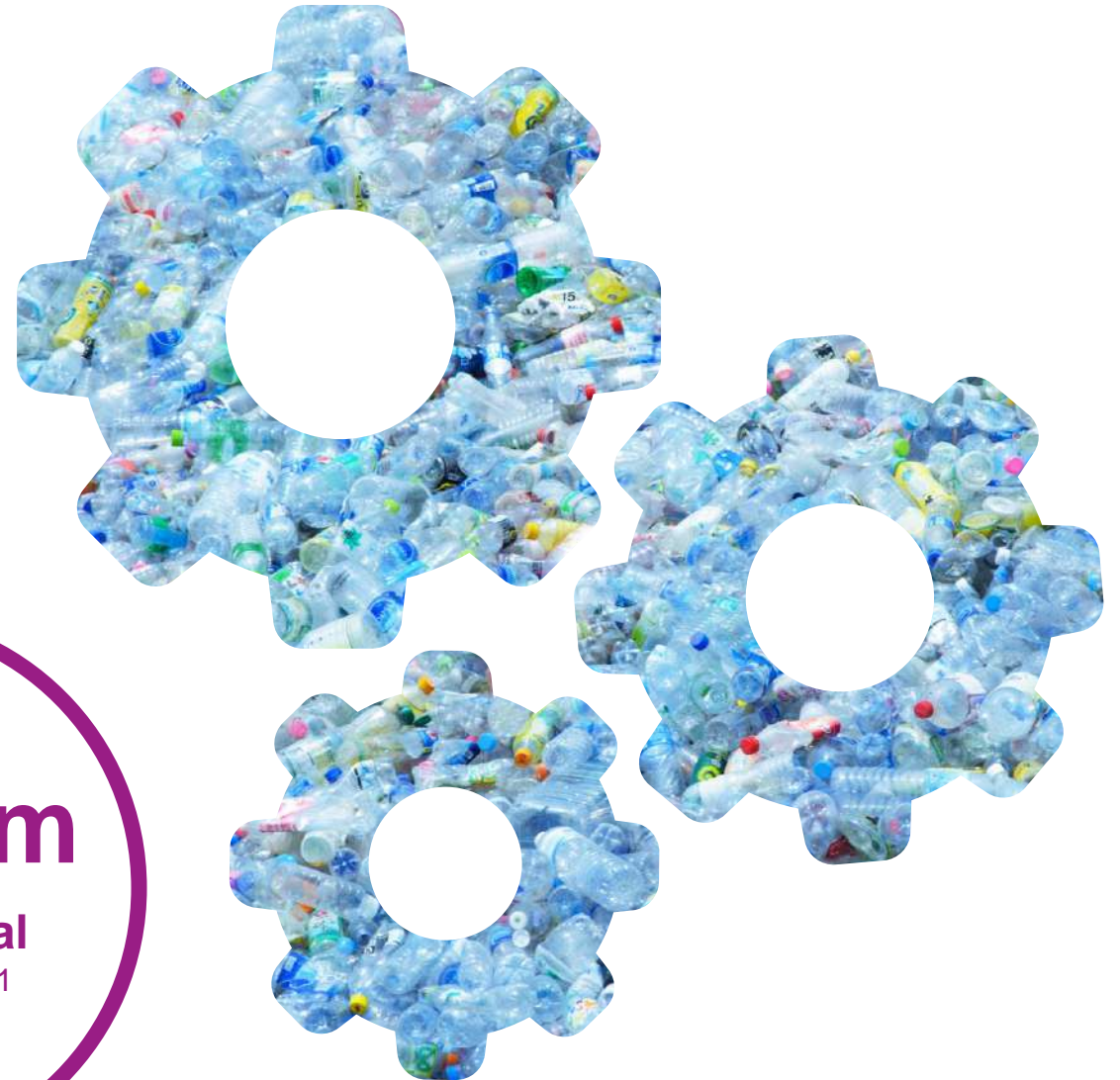


# MECHANICAL AND CHEMICAL RECYCLING

- Providing technologies and services to recover valuable resources from disposed materials
- Additives for performance upgrade
- Additives, catalysts & expertise for efficient processing

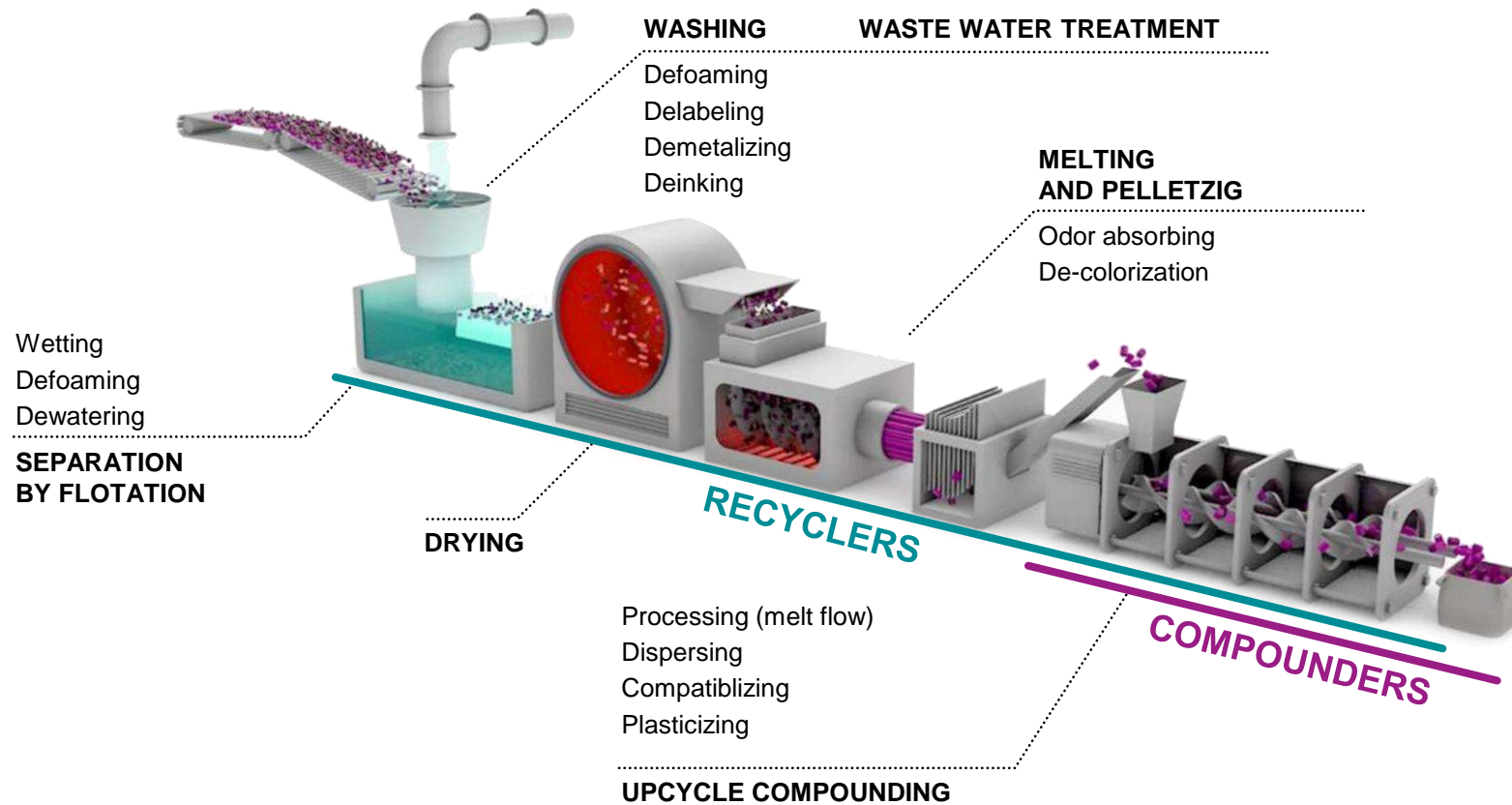
**>€350 m**

**sales potential  
p.a. by 2030<sup>1</sup>**



1: Sales potential from Evonik Circular Plastics Program on Group level

# Our technologies help along the entire process of mechanical plastics recycling



## Mechanical Recycling





- During separation/washing, **our additives help to make recycling processes more efficient** resulting in higher quality of recyclates
- During compounding, **our additives improve processing** leading to competitive costs and quality

# Emerging solutions for highest flexibility and eco-efficiency of chemical recycling



# Mattress recycling is an example how Evonik enables circular PU solutions

 Recycled components are processed into corresponding PU precursors

 **Evonik process** enables mattress recycling via hydrolysis of PU



Various business model options



**Evonik additives** allow for high use level of recycled PU components and reduction of scrap rate



Additives

Enjoys highest performance with significantly reduced CO<sub>2</sub> footprint

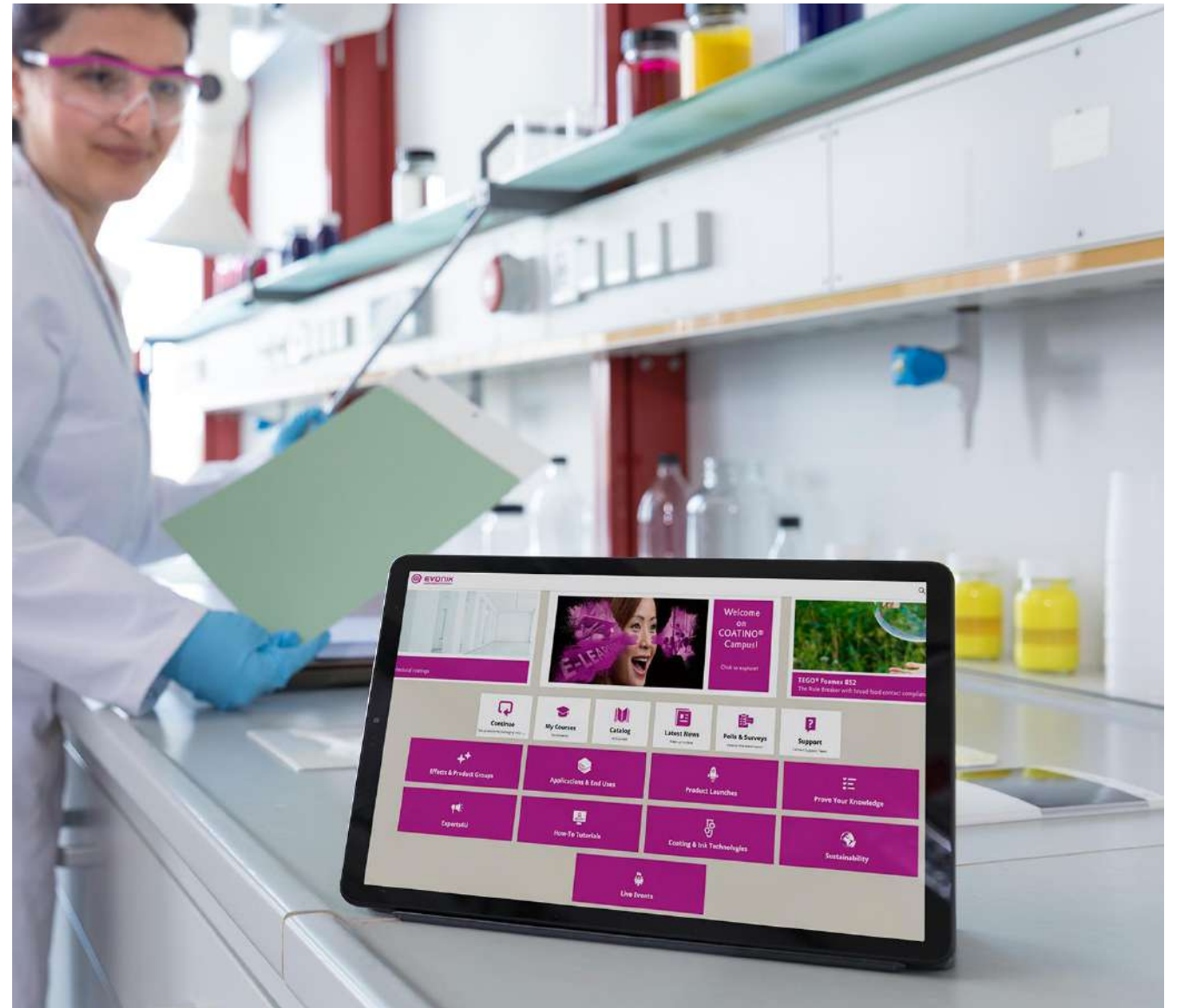
On average, a mattress is discarded after ten years (approx. 30 m mattresses per year in the EU ~ 450kt<sup>1</sup>)

1: Source: Federal Association secondary raw materials

# DIGITAL SOLUTIONS

Specialty Additives  
Division Spotlight Series 2021

Gaetano Blanda, Head of Coating Additives



**DIGITAL SOLUTIONS  
ENABLE THE  
FUTURE SUCCESS  
OF OUR  
ADDITIVES  
BUSINESSES**



Our digital solutions  
improve ...

... the customer  
experience  
(frontend)



... the products  
we create  
(backend)



# Evonik digital solutions help coating customers to become more efficient in formulating or reformulating

Our customers are spending

~€4 billion per year

to reformulate existing coating solutions<sup>1</sup>

Digital solutions from Coating Additives help coating customers to become more efficient in formulating or reformulating coating solutions:

- 20-30% less iterations required due to specific data models
- Faster validation of results when using high throughput equipment (HTE)

**Benefit for Customer: >20% cost savings and improved time-to-market**

**Benefit for Coating Additives: Share of cost savings, formulation data of customers**

1: Source: Evonik estimate

# Evonik's High Throughput expertise significantly reduces time and costs when formulating a coating



Formulating a coating is complex and time consuming

300+

different coating additives produced by Evonik

40

effects can be elicited using these additives

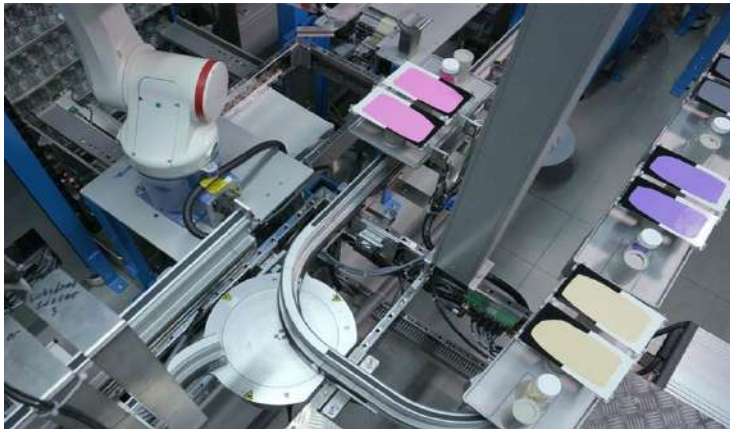


No single source of truth – but enormous complexity

## Sample calculation

10 solvents × 10 binders  
× 10 pigments × 10 additives  
= **10k combinations<sup>1</sup>**

Manually: >10 years



  
**Solution:**  
High Throughput Equipment (HTE)

## Fully automated:

- Prepare a large number of coating formulations
- Coat different types of panels
- Evaluate the coated panels with a variety of tools and measures to analyze coating performance

## Sample calculation

10 solvents × 10 binders  
× 10 pigments × 10 additives  
= **10k combinations<sup>1</sup>**

HTE: <6 months<sup>2</sup>

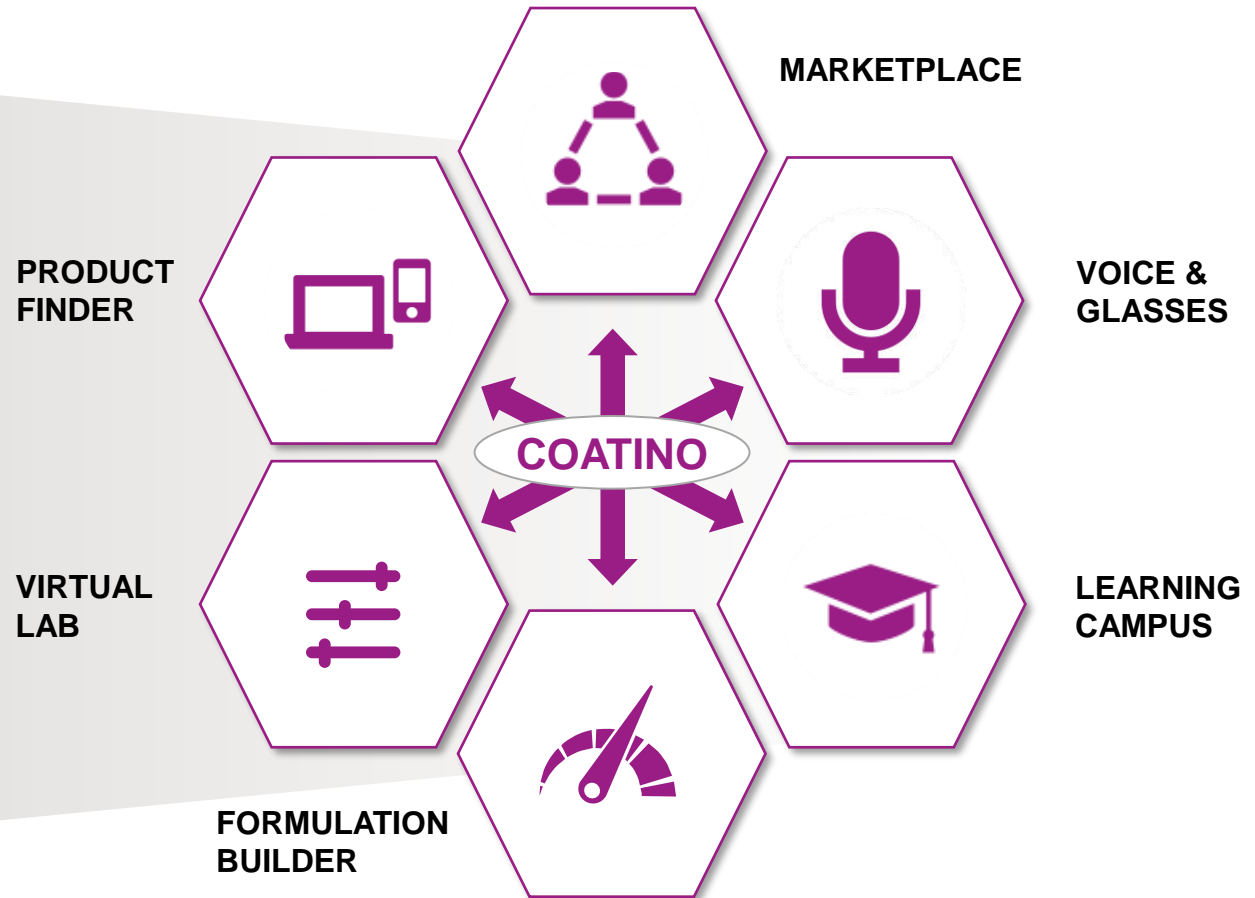
1: Changes in mixing ratios are not taken into account, therefore many more combinations would be tested under real conditions

2: Standard samples



# Evonik has launched COATINO as coatings industry-specific solution to manage complexity, increase efficiency and support innovation

## THE DYNAMIC FORMULATION NETWORK



# SMALL AMOUNT. BIG EFFECT.

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Lauren Kjeldsen  
President of Specialty Additives



# Growth opportunities driven by sustainability and digitalization

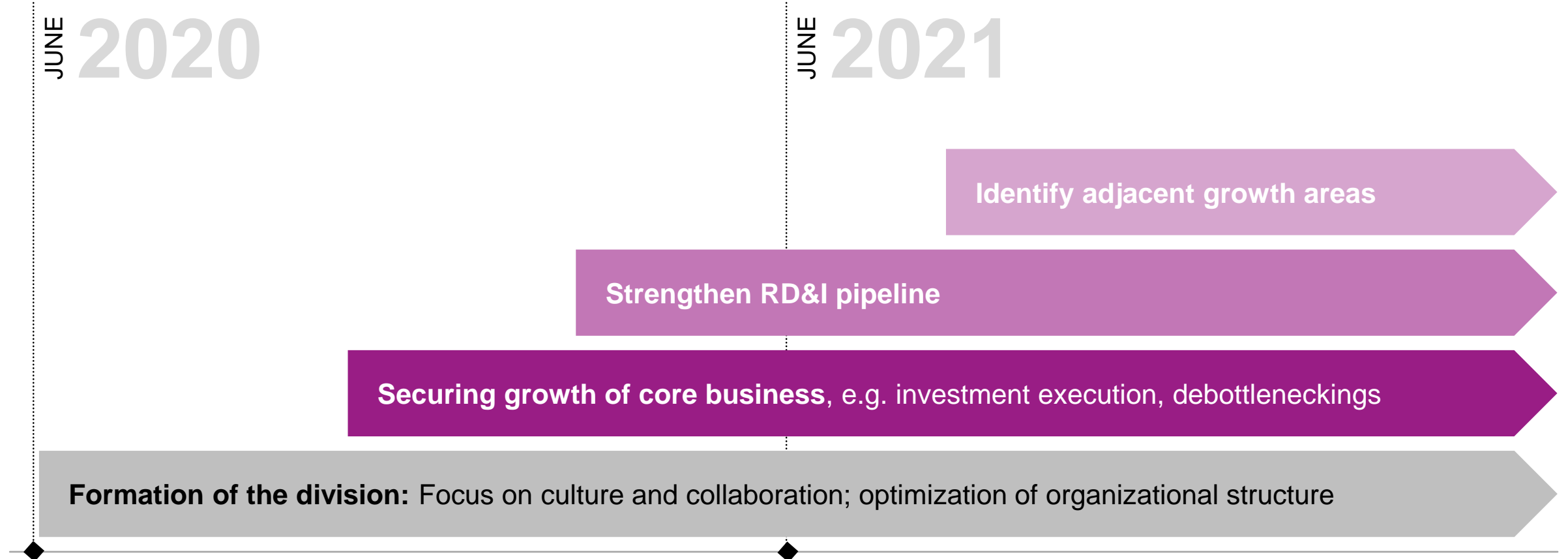
## Strong base for future growth



**Key growth driver: Sustainability**

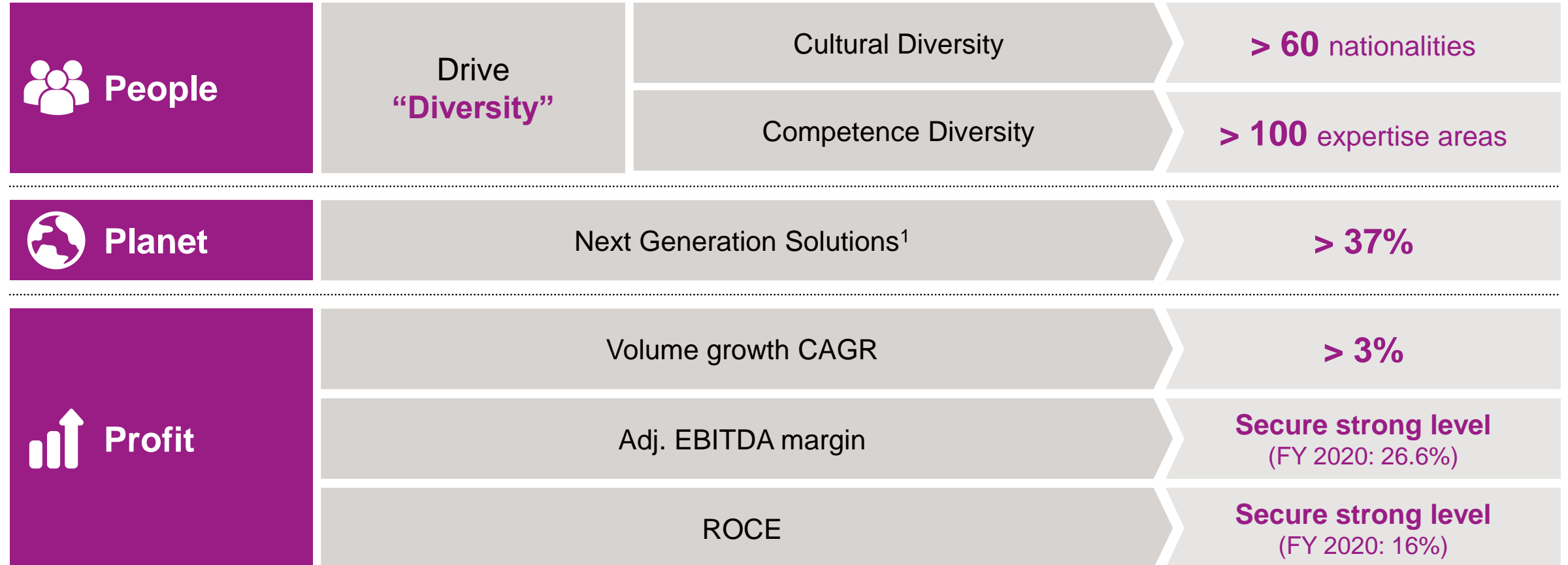
**Enabler: Digitalization**

# Since formation of the division we are driving a clear strategic agenda



## Mid-term targets

We will drive diversity, sustainability and value from a very strong foundation



1: Products and solutions with a clearly positive sustainability profile that is above or well above the market reference level

# Specialty Additives Play

## Sitting at the table



**Building #1 position in customer relevance**

to be decisive part of their innovation agenda and product offering

## Ability to assess



**Understanding our customers' value chains and markets** to create the ideal solution

## Rapid tailored innovation



**Delivering continuously new solutions** for markets and customers

## Mastering complexity



**Broad spectrum of tailored product** for numerous customers



**EVONIK**

**Leading Beyond Chemistry**

# Specialty Additives: Five major technology platforms

Amines	Isophorone chain	Silicones	Oleochemicals, Silica & BL specific platforms
Special catalysts for high performance spray foam insulations	Crosslinkers for durable wind turbine blades	Silicone surfactants for designed polyurethane foams in mattresses, seats and insulation	Additives and dispersing agents for waterborne artificial leather
Curing agents for high quality and efficient epoxy coating and flooring	High performance composite ingredients for electro vehicle components	Highly effective polyether siloxane defoamer for waterborne coatings	Scratch/scrub/burnish resistance with spherical amorphous silica
			Poly alkylmethacrylate for fuel efficient lubricants

Technology platforms with modular, stepwise and capex-light expansion

~4%

capex to sales ratio

## Investment example: Amines platform

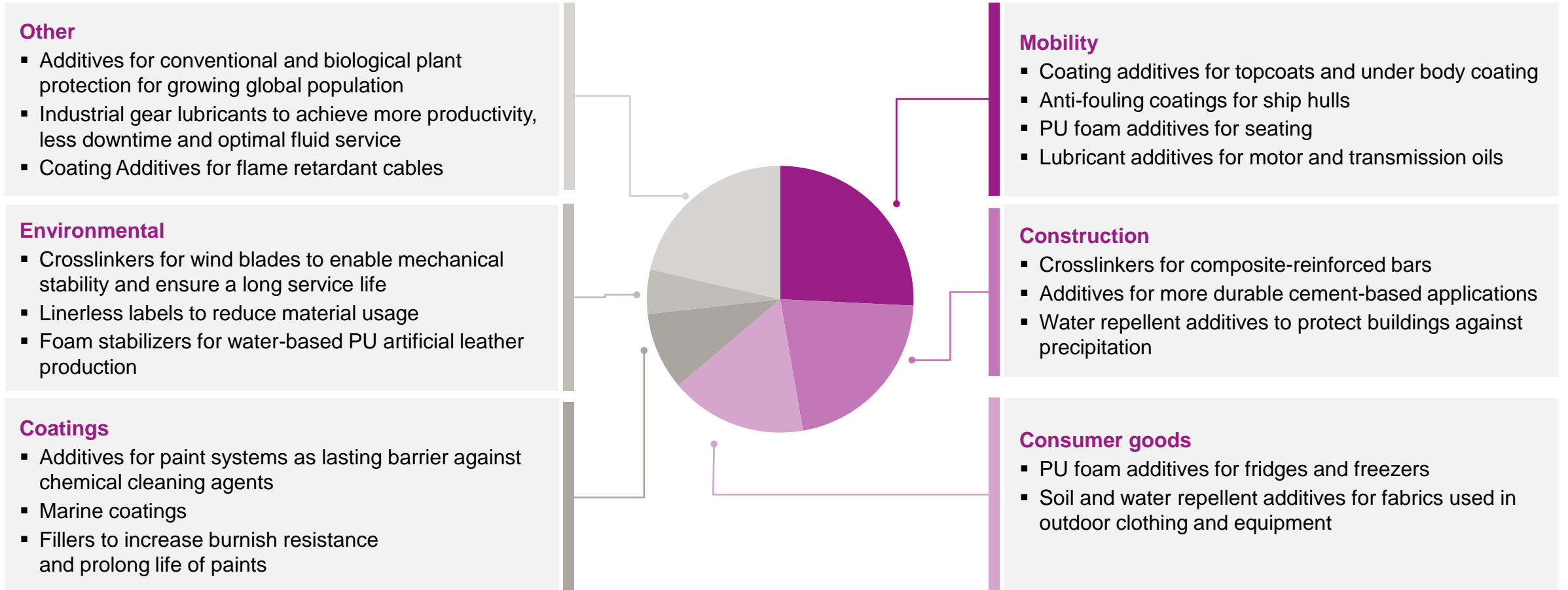
Stepwise debottlenecking of intermediate products in China and the US

## Investment example: Silicones platform

Implementation of expanded regional hubs in Europe, China and the US



# Specialty Additives end markets and product examples



# We make a difference

Solutions for maximum performance



**SILIKOTOP®**  
for ultra-high-solids top coats  
MORE PROTECTION



**TEGOSTAB®**  
for lighter and comfortable seating  
LESS ENERGY



**TEGOMER®**  
for scratch resistant surfaces  
MORE DURABILITY



**VISCOPEX®**  
for fuel economy improvement  
LESS ENERGY



**Nourybond®**  
for under body coating  
MORE PROTECTION



# We make a difference

Solutions for maximum performance

**Ancamide®**  
for wet on wet floor coatings  
LESS ENERGY



**TEGOSIVIN®**  
for more durable cement-based applications  
LESS MAINTENANCE



**DABCO®**  
for integrity of roofings  
MORE DURABILITY



**SPHERILEX®**  
for wall paints  
MORE DURABILITY



**VISIOMER®**  
for waterborne architectural coatings  
MORE PROTECTION



# We make a difference

Solutions for maximum performance



**TEGO®**  
for improved plastic coatings  
LESS MAINTENANCE



**TEGOSTAB®**  
for fridges & freezers  
LESS ENERGY

**TEGOMER®**  
for food packaging  
MORE DURABILITY



**VISIONER®**  
for countertops and sinks  
MORE DURABILITY



**VESTAGON®**  
for coatings of household appliances  
MORE PROTECTION



# We make a difference

Solutions for maximum performance

**AIRASE®**  
for durable coatings  
MORE DURABILITY



**DABCO®**  
for roof and wall insulation  
LESS ENERGY

**Ancamine®**  
for resistant top coats  
LESS MAINTENANCE



**VISIOMER®**  
for weather and scratch resistance  
MORE PROTECTION



**TEGOMER®**  
for flame retardant cables  
MORE PROTECTION



# We make a difference

Solutions for maximum performance



## TEGO® RC

for reducing paper waste in food, logistics & e-commerce labeling

LESS ENERGY



## VESTAGON®

for PU powder coatings

MORE PROTECTION



## NANOPOX®

for more durable wind turbine blades

LESS MAINTENANCE



## DYNAVIS®

for reduced emissions

LESS ENERGY



## TEGO®

for FDA approved can coatings

MORE DURABILITY

