

SMART MATERIALS

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Division Smart Materials

We find solutions for
the needs of today and
tomorrow.

Smart Materials at a glance

TECHNOLOGY PLATFORMS

Inorganics

- e.g.
- Hydrogen peroxide
 - Catalysts
 - Silica

Polymers

- e.g.
- PA12
 - Gas separation membranes
 - Performance foams

€3.4
billion
sales

€649
million
adjusted EBITDA

19.3%
profitability
(adjusted EBITDA
margin)

16%
return on capital
employed (ROCE)

7,500
employees

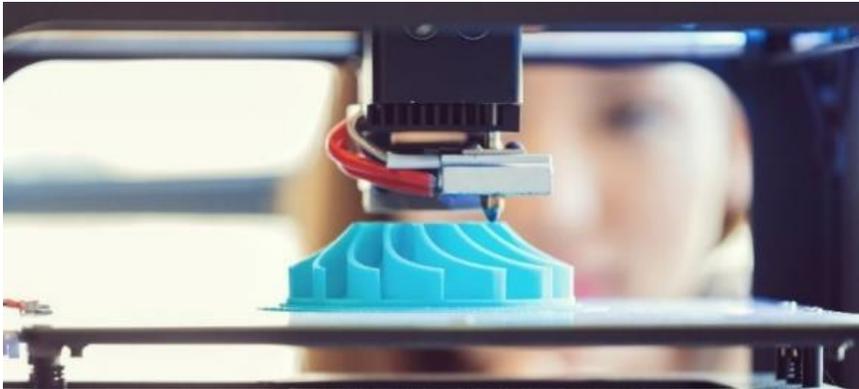
Financials FY 2019

Smart Materials – Key characteristics

Resource-efficient and environmentally-friendly solutions

Key characteristics

- **Environmentally-friendly solutions**
- Broad expertise and portfolio for **complex customer requirements**
- **Global market leading positions** with high economies of scale

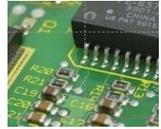


Growth drivers

- **Saving resources**
- Increasing use of **lightweight materials**
- **Stricter regulation** and **safety standards**

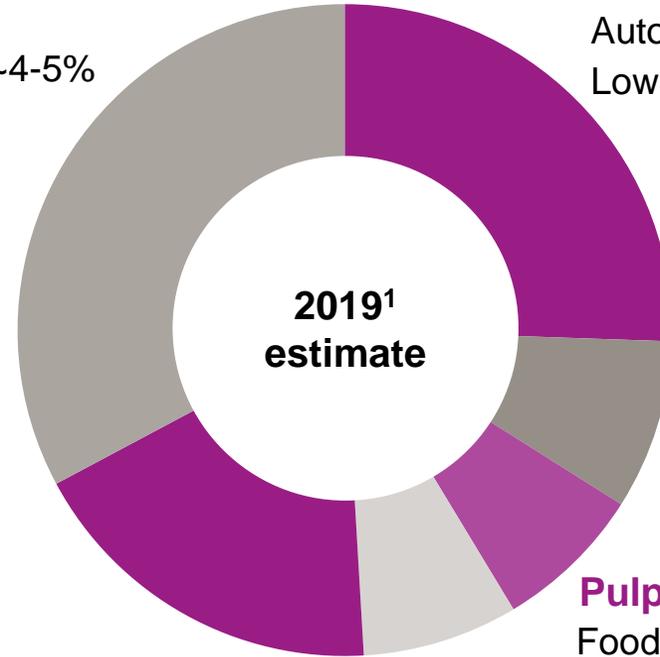
Smart Materials – End markets

Attractive end markets with consistent GDP+ growth



Others, e.g.

Structural Adhesives & Sealants: ~4-5%
Additive Manufacturing: ~6%



Automotive, transportation and machinery

Automotive plastics: ~4-5%
Low energy tires: ~5%



Plastics & Rubber

Silicone Rubber: ~4%



Personal Care, Food, Feed, Pharma

Dental: ~4%
Food & feed treatment: ~4%

Pulp, Paper, Packaging

Food packaging: ~4%



Construction

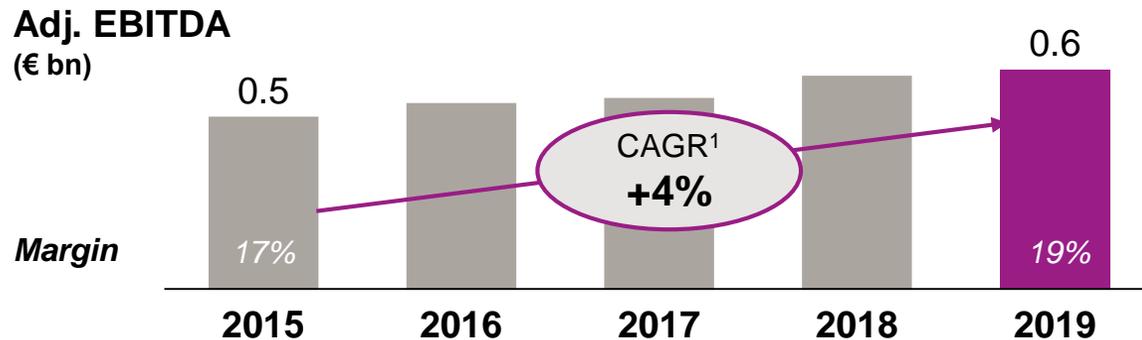
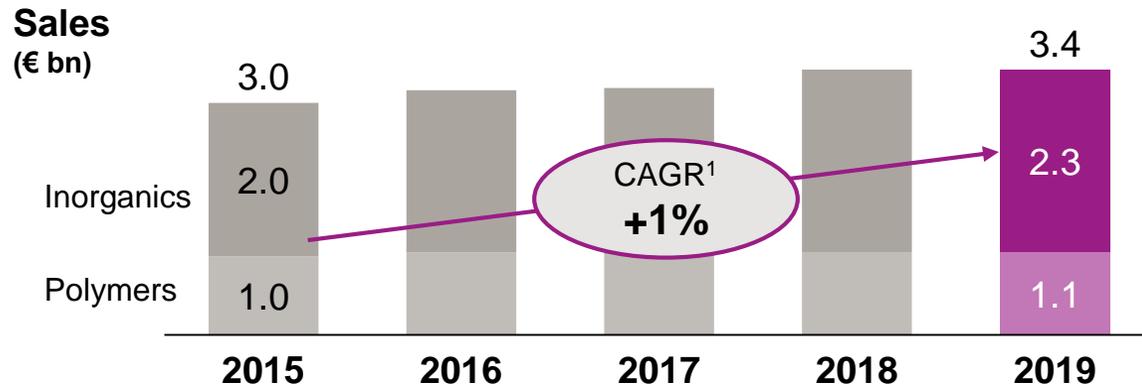
Thermal insulation: ~8%
Building protection: ~6%

1. End market growth rate, CAGR estimates 2020-2022

Financial track record

Solid earnings growth and margin progression

Smart Materials



- **Steady earnings & margin expansion**
 - **Strong pricing power** & shift towards lower-volume specialties
 - **ROCE of ~16% in 2019** (including Huber goodwill)
-
- **Ambitions going forward:**
 - **Secure margin level** at least in range of 18 - 20%
 - Continue strong **track record in pricing power;** **capacity expansions** driving growth going forward

1: Organic Sales / EBITDA CAGR = adjusted for Huber acquisition

Sustainability – Examples “Next Generation Solutions”

Addressing customers desire for sustainable solutions

Lithium-Ion-Batteries



Nanostructured materials to improve electrode and separator performance

Evonik’s superiority to market

- Evonik’s **nanostructured** high quality metal oxide and silicon particles **improve safety, lifetime and energy density** of batteries

Growth >20%

Superinsulation



Purely mineral high-performance insulation material

Evonik’s superiority to market

- **Silica-based** insulation material which is **fully recyclable** and **incombustible** for sustainable housing

Growth >20%

Gas separation membranes



Innovative membranes for water electrolysis to generate renewable hydrogen

Evonik’s superiority to market

- Evonik wants to make **green hydrogen** more affordable which is a beacon of hope in the **energy transition**

Growth >14%

Circular Plastics



Overarching program to grow beyond existing business

Evonik’s superiority to market

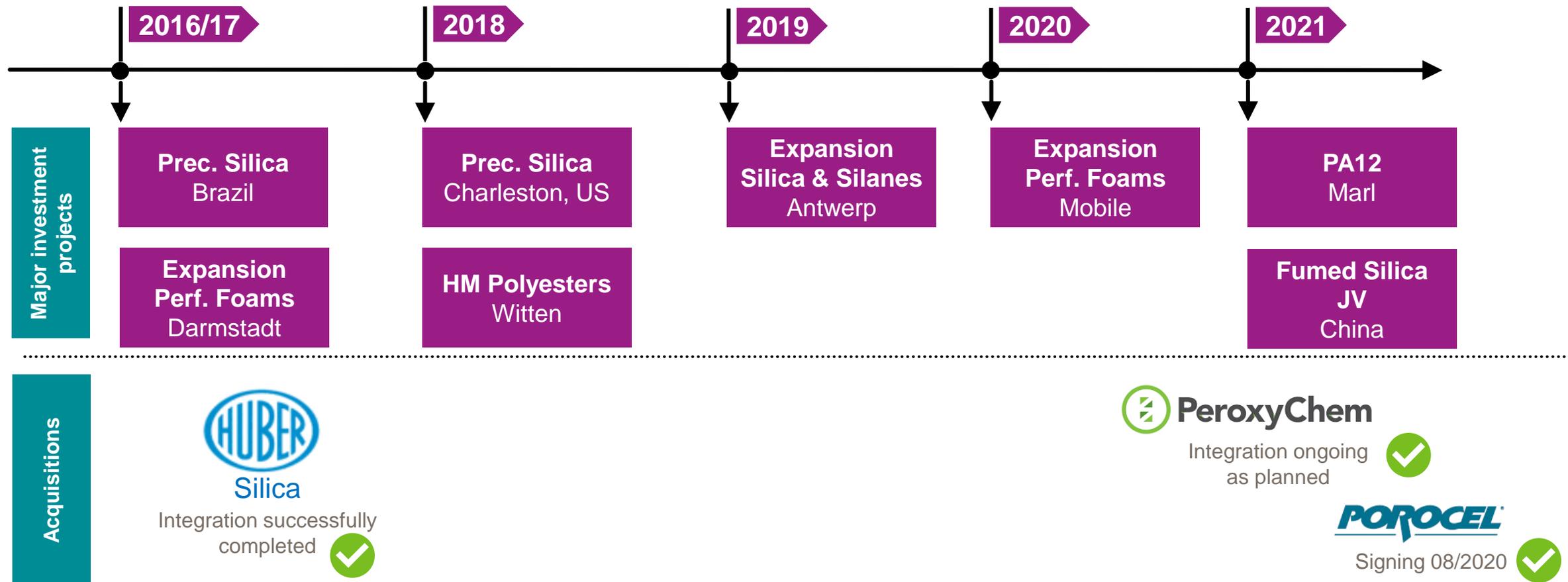
- Circularity agreements to **recover** Engineering Plastics
- Concepts and technologies towards circular rubber

Transforming Markets

Significant progress in the growth agenda has been achieved

...with major investment projects and bolt-on acquisitions

Milestones / Major strategic measures in Smart Materials



M&A track record: Porocel

Leading global provider of specialty catalysts and related services

Porocel

- Headquarter in Houston, Texas (USA)
- Ownership: privately held company
- Headcount: ~300 globally
- Locations: 6 manufacturing facilities in USA, Canada, Luxemburg, Singapore and China

Key products:

- Full suite of critical hydro-processing catalyst services, including a patented technology for highly efficient rejuvenation of desulfurization catalysts
- Leading supplier of purification adsorbents and sulfur recovery catalysts used in the petrochemical, fine chemicals and petroleum refining industries

The logo for Porocel, featuring the word "POROCEL" in a bold, green, italicized sans-serif font. The letters "P" and "O" are connected, and the "R" is stylized with a vertical line through it. The logo is underlined with a thin blue line.

ADSORBENTS, CATALYSTS & SERVICES

Sales
2019:
~\$100 m

adj. EBITDA
2019:
~\$23 m

adj. EBITDA margin: ~23%

M&A track record: Porocel

Excellent complementary fit with Evonik's catalysts business

Evonik catalyst business



Porocel catalyst business

- Strong **catalyst customization know-how** and scale-up competencies
- Well positioned in “**Fine Chemicals & Intermediates**” segment for e.g. agriculture, food, pharmaceuticals
- **Sales** and **EBITDA** CAGR of **~10%** since 2014 – significantly above overall market growth

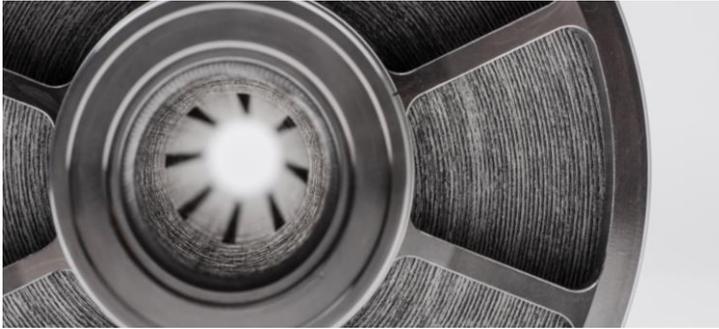
- Leading market position in the field of **rejuvenation of desulfurization** catalysts
- Core markets with attractive growth and trends towards **sustainability and circular economy**
- Established relationships with **blue-chip customers in refining & petrochemicals**
- Access to **available production capacities** with high economies of scale

Acceleration of growth strategy of Evonik's catalyst business
Positioning from multi-niche to a **leading supplier** in the chemical catalyst market

Innovation – latest highlights

Improving our portfolio with attractive innovative products

Membranes



PuraMem® VOC - *polymer-based membrane technology for efficient gas separation*

- Development of a new membrane for separation of **volatile organic compounds**
- Leading innovation due to **full backward integration** enabling membrane properties to be adjusted on the base material stage

Additive Manufacturing



INFINAM® – *Next generation of ready-to-use polymer powders for 3D printing*

- **World leader** in the production of **polyamide 12 powders** for additive manufacturing
- Development of new **PA 12 powder materials** with **best in class reusability rate**

Hydrogen Peroxide



HYPROSYN® – *direct synthesis of propylene glycol using hydrogen peroxide (HPPG)*

- Development of a **disruptive new technology**
- **Joint technology development agreement (JDA)** and strategic partnership **with DOW** on track

Smart Materials – Strategic agenda

Expand technology and cost leadership

Pillars for growth

Organic growth

Innovation

Selective M&A

Strategic measures

- Capture growth opportunities and expand leading market positions
- Leverage and optimize strong technology positions and global asset network
- Continue efficiency programs

- Continue globalization of innovation activities
- Expand fast growing areas, e.g. thermal insulation, additive manufacturing
- Sustainability: Drive sales with “Next Generation Solutions”

- Active portfolio management to strengthen existing businesses
- Focus on highly attractive bolt-on acquisitions, e.g. PeroxyChem, Porocel
- Pursue complementary technology acquisitions



EVONIK

Leading Beyond Chemistry

Growth Drivers: Additive Manufacturing

A strong base offering further growth opportunities

Strong base established

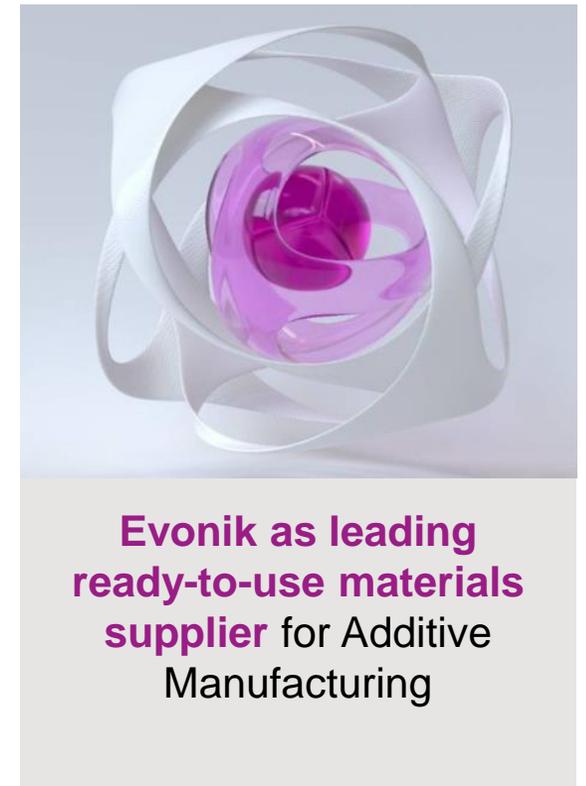
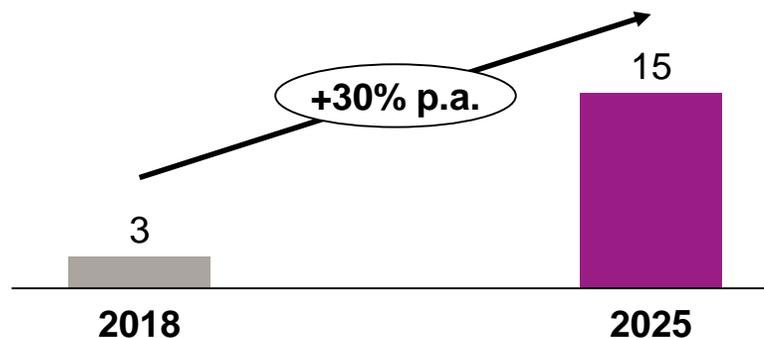
- Evonik as **market leader** in PA12 powder-based 3D printing materials
- **Several platforms available** to serve all major powder-based printing technologies
- **Close partnerships** with major printing players and innovators:



Expand strong position to new applications and new materials

- Establish position in emerging technologies like **high performance photo-resins**
- **Expand business in medical applications** with implantable PEEK and bio-resorbable RESOMER
- **Capture growth potential** of shift from “prototyping only” into real series production:

Non-metal 3D-printing materials market (in €bn)



Growth Drivers: H₂O₂

Shifting consumer & producer preferences in food & beverage processing

Customer challenge in aseptic packaging

- Consumer demand for **more nutritional natural drinks** (more conducive environment for microbial growth)

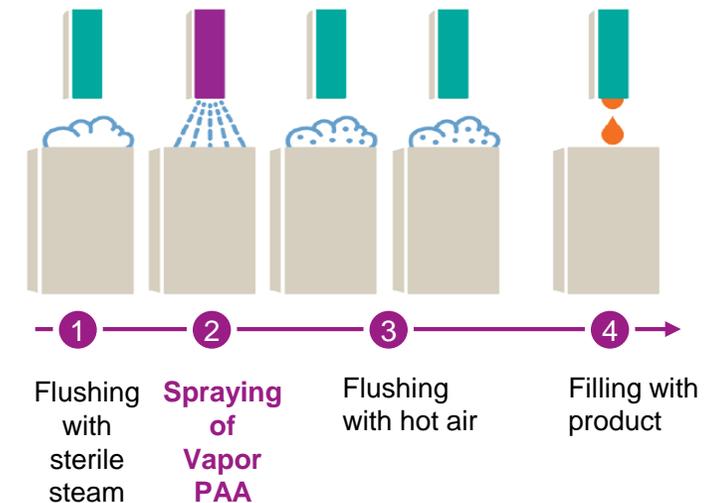


- Producer demand for **more cost effective, high speed PET bottle filling systems**
- **More innovative bottle designs**
- Sustainability trend to **thinner packaging**

Technical challenges in existing sterilants and applications

Evonik solution: Spraying Technology “Vapor PAA”

- **New Vapor PAA technology** (as alternative to liquid Peracetic Acid or Vapor H₂O₂) for spray sterilization
- Greatly reduces water and energy consumption
- Withstands lower temperatures, which increases bottle options



Growth drivers: Silica

Broad-based specialty silica portfolio with >€1 bn of sales

Facts

#1

supplier for fumed and precipitated silica as well as metal oxides

32

industries served by industry experts

>100

products to solve customer challenges

~260

R&D and Applied Technology experts

26

production sites with global coverage

Broad specialty silica portfolio



Precipitated Silica



Fumed Silica



Metal Oxides

- **Portfolio** with exposure to various end-markets
- Growth focus on **customer-oriented solutions** in niche markets
- Strong **innovation capabilities** – 20 new products since 2017

Specialty portfolio constantly supplemented by product innovations like...



... silica for eco-friendly cosmetic

>3%
p.a.

- SPHERILEX®
- Versatile and eco-friendly alternative to microplastics in leave-on and color cosmetic applications



... Separators for Lithium-Ion-Batteries

>5%
p.a.

- AEROXIDE®
- High quality pure silica and metal oxides separators increase safety, lifetime and performance of batteries for EVs

1: Portfolio includes precipitated, fumed and metal oxides applications

Evonik well positioned in e-mobility

Leveraging significant additional opportunities of e-mobility trend

- Evonik with high exposure to automotive sector, e.g. tires, lubricants as well as plastics and composites
- **Electric cars** play **significant role** in **new car production** with **growth rates** of up to **30%***
- Evonik positioned as a **key material supplier** for e-mobility



Additional opportunities arising

Plastics and composites	➔	Cooling lines, charging and high voltage cables
Lubricants	➔	Cooling fluids and e-motor greases, hybrid transmission
Tires	➔	Reduced rolling and higher abrasion resistance
Adhesives & Sealants	➔	Gap fillers for batteries, noise reduction, vibration and harshness
Batteries	➔	Specialty additives for battery separators, cathodes and anodes

*CAGR (2017-2021)

We find solutions by cooperation and collaboration with Research Institutes, strategic partnerships and venture capital

 STRATEGIC PARTNERSHIPS



 COOPERATIONS



 VENTURE CAPITAL

