



New Business Development in Finland

September 3, 2019

EXTERNAL

BASF – We Create Chemistry

- Our chemistry is used in almost all industries
- We combine economic success, social responsibility and environmental protection
- Sales 2018: €62.7 billion, EBIT before special items 2018: €6.4 billion
- Employees (as of December 31, 2018): 122,404
- 6 Verbund sites and 355 other production sites
- Over 90,000 customers from various sectors in almost every country in the world
- In 2018, BASF filed for around 800 new patents worldwide



Agenda

1 | BASF at a glance

2 | BASF drives electromobility and battery materials

3 | BASF's investment plans for battery materials in Finland

BASF's segments



Chemicals

Petrochemicals
Intermediates



Materials

Performance Materials
Monomers



Industrial Solutions

Dispersions & Pigments
Performance Chemicals



Surface Technologies

Catalysts
Coatings
Construction Chemicals*



Nutrition & Care

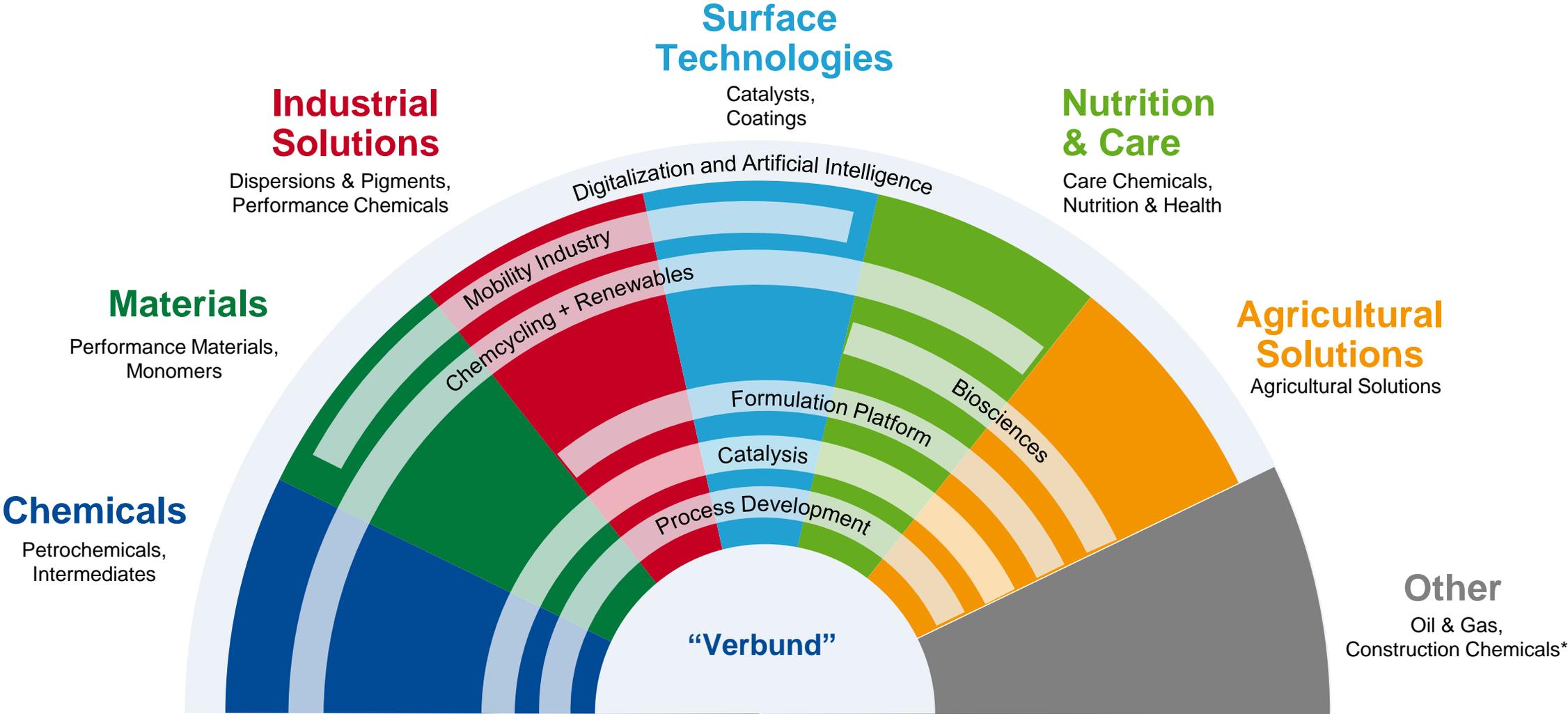
Nutrition & Health
Care Chemicals



Agricultural Solutions

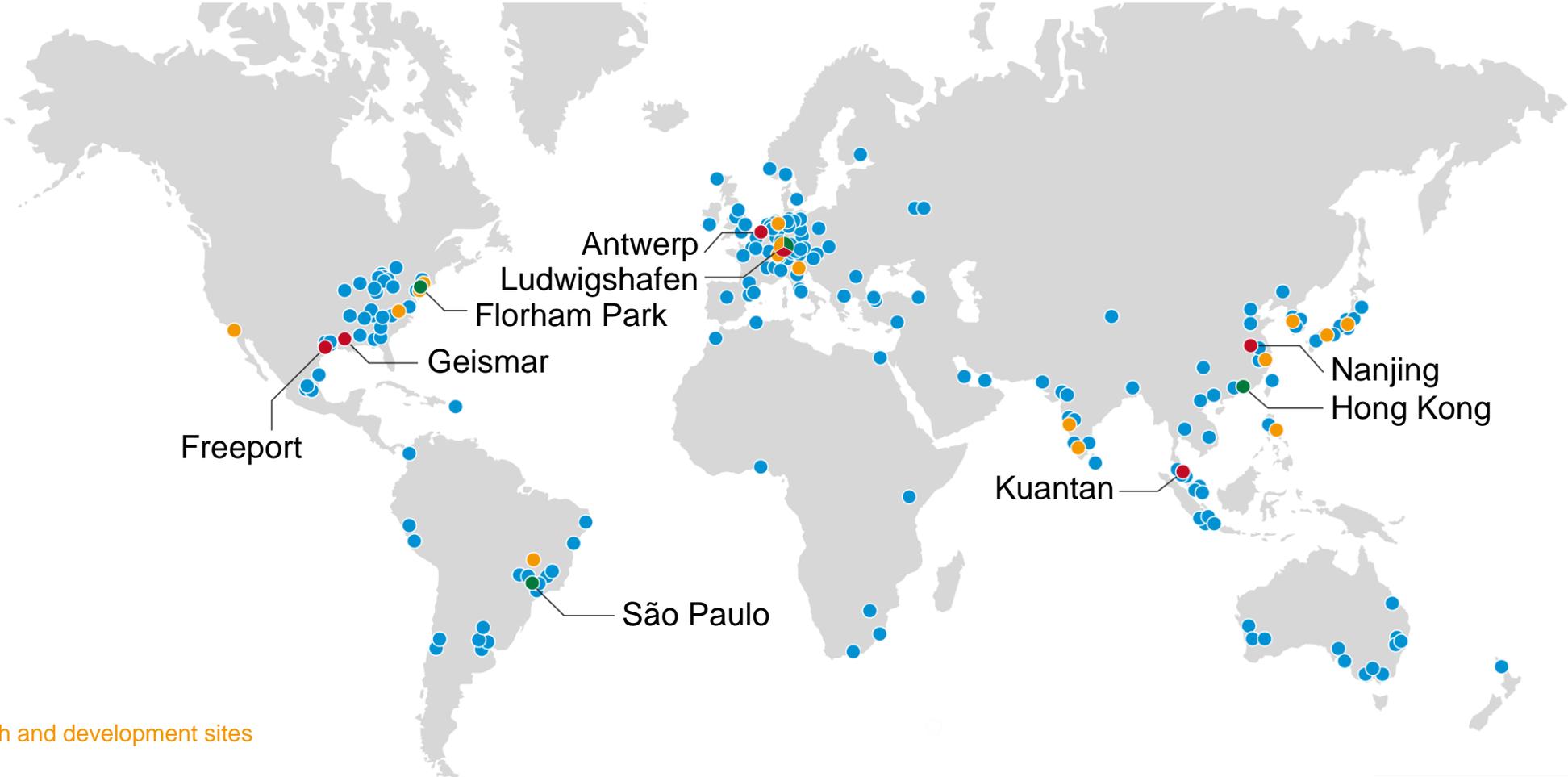
* We are considering the possibility of merging our construction chemicals business with a strong partner, as well as the option of divesting this business. The outcome of this review is open. The Construction Chemicals division will be reported under the Surface Technologies segment until signing of a transaction agreement.

BASF's segments



*Target picture, until signing of a transaction agreement, Construction Chemicals will be reported under Surface Technologies

BASF worldwide: sites



Regional centers

Selected sites

Verbund sites

Selected research and development sites



 **BASF**
We create chemistry

BASF in Finland



BASF key industries in Nordic countries and locations in Finland

Key industries



Pulp & Paper + Packaging



Agriculture



Construction

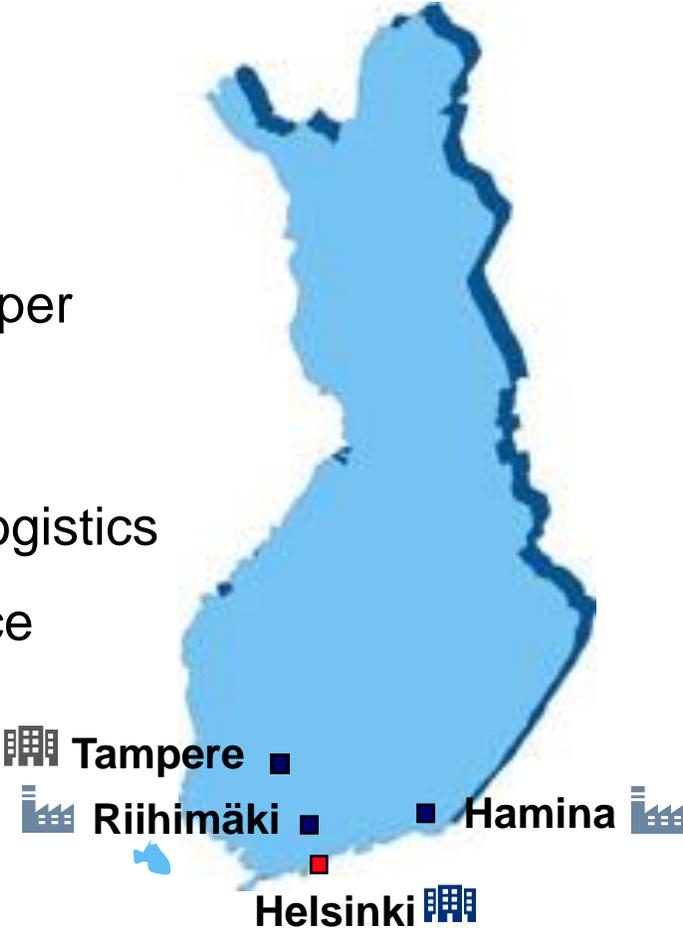


Automotive



Nutrition & Health

- Helsinki: office
- Hamina: production of paper coating chemicals
- Riihimäki: construction chemicals, Glasurit and logistics
- Tampere: Chemetall, office



Agenda

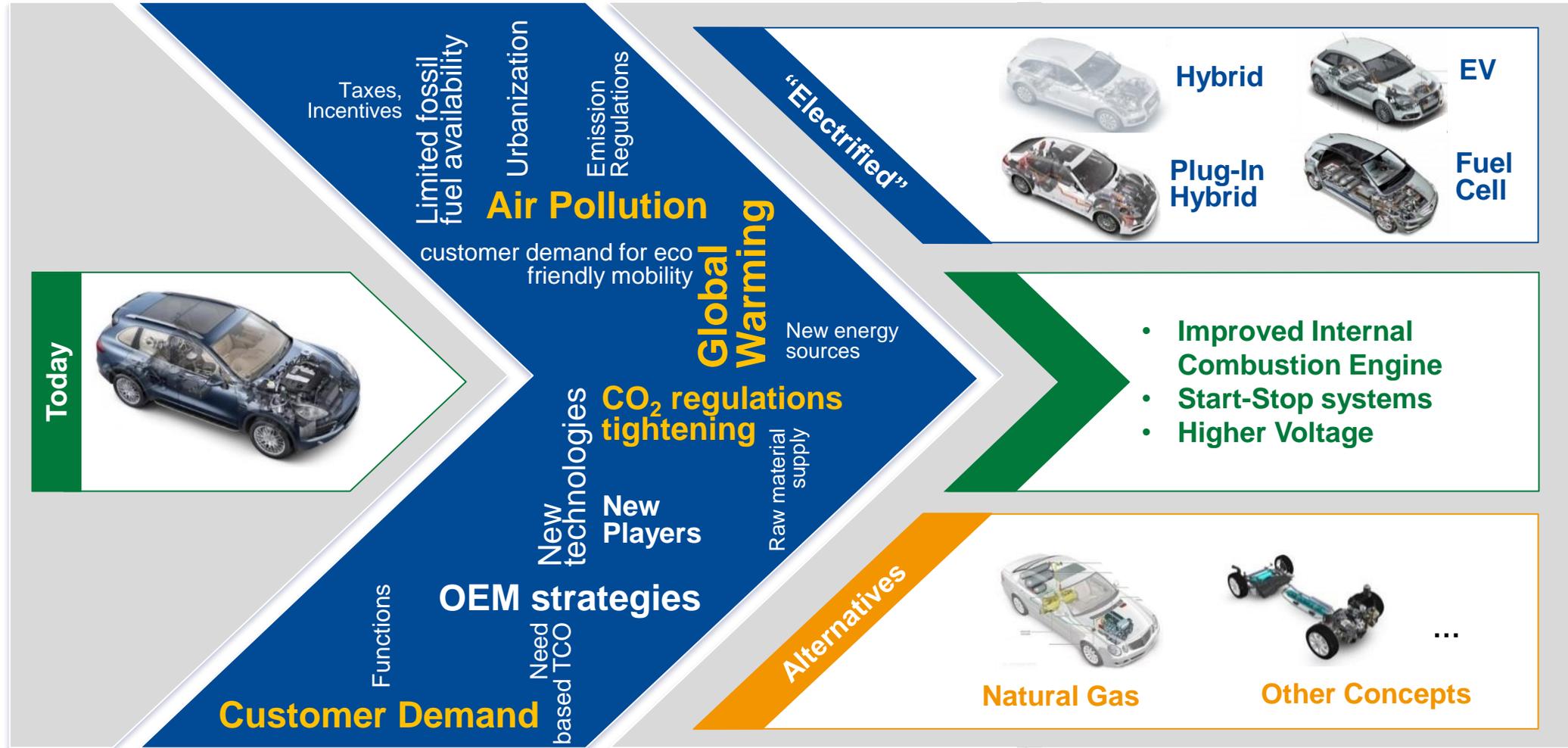
- 1 | BASF at a glance

- 2 | BASF drives electromobility and battery materials**

- 3 | BASF's investment plans for battery materials in Finland

Trends in Automotive Industry

Factors leading to a diversification in powertrain technology



BASF's leading position in the battery value chain

Established capabilities on cathode active materials (CAM)

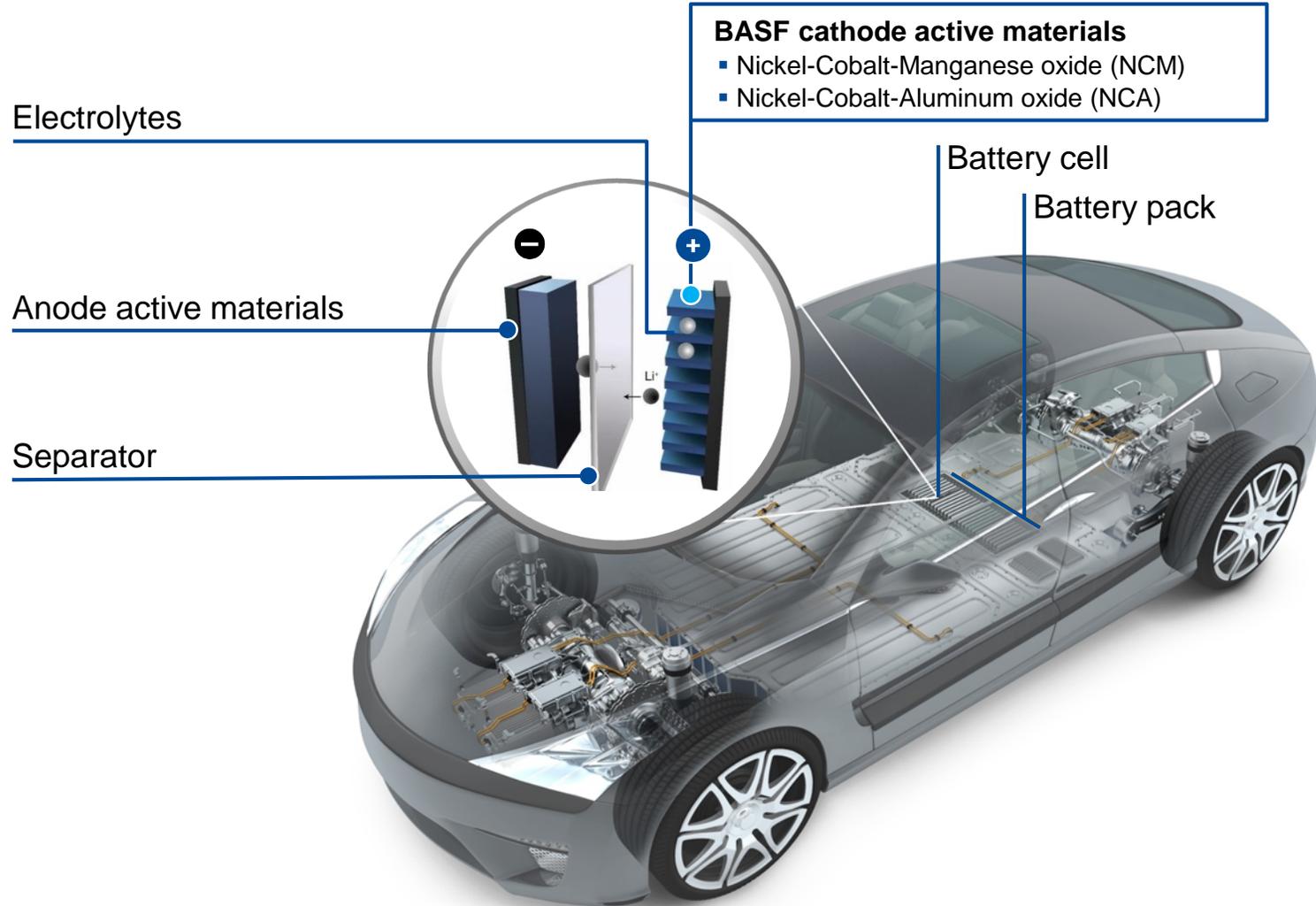


BASF is a leading supplier of high energy density CAM to the automotive industry

Nickel Cobalt Manganese Oxide (NCM) & Nickel Cobalt Aluminum Oxide(NCA)

- Own precursor and cathode active materials manufacturing
- Global footprint, R&D, technology centers and production sites
- Comprehensive IP portfolio

BASF focuses on high energy density cathode active materials (CAM)



- BEVs need substantially more Cathode Active Materials (CAM) than other applications
- CAM chemistry and battery design are key to energy density affecting battery weight, range and safety
- Tailored CAM to meet battery performance, lifespan, cost targets
- BASF offers one of the broadest CAM portfolios in the industry (NCA, NCM)
- **Global market leader in NCA: highest energy density CAM for Electric Vehicle (EV) application**

Agenda

- 1 | BASF at a glance

- 2 | BASF drives electromobility and battery materials

- 3 | BASF's investment plans for battery materials in Finland**

Strong market presence with cathode active materials operations in all major regions

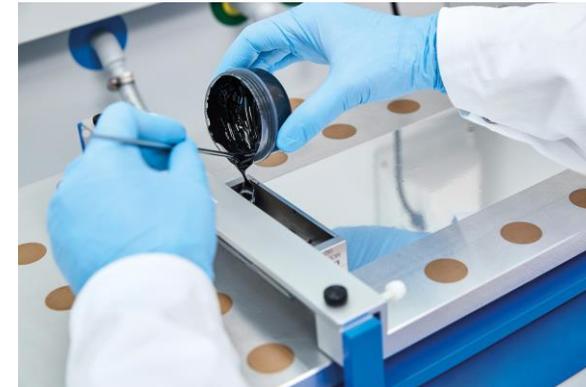


Market presence

- Supplier to world's largest cell producers and leading OEM platforms
- Under qualification for future key platforms
- Fostering a responsible and secure metals supply, trading liquidity and price transparency

BASF investment in battery material plant in Harjavalta

- Part of a €400 million multi-step investment plan to meet the growing cathode materials demand from the European automotive market
- Locally sourced and secure supply of raw materials cobalt and nickel from Nornickel's refinery in Harjavalta
- Utilization of locally generated renewable energy sources, including hydro, wind and biomass



Reinforces BASF's support of the EU Commission's agenda towards a European battery production value chain



We create chemistry

Summary

Market

- **Evolution** of new power train concepts and **transformation** of the automotive industry in full swing
- Strong growth momentum projected for **battery electric vehicles (BEVs)** and **hybrids**
- **Electromobility creates opportunity** for BASF

Performance

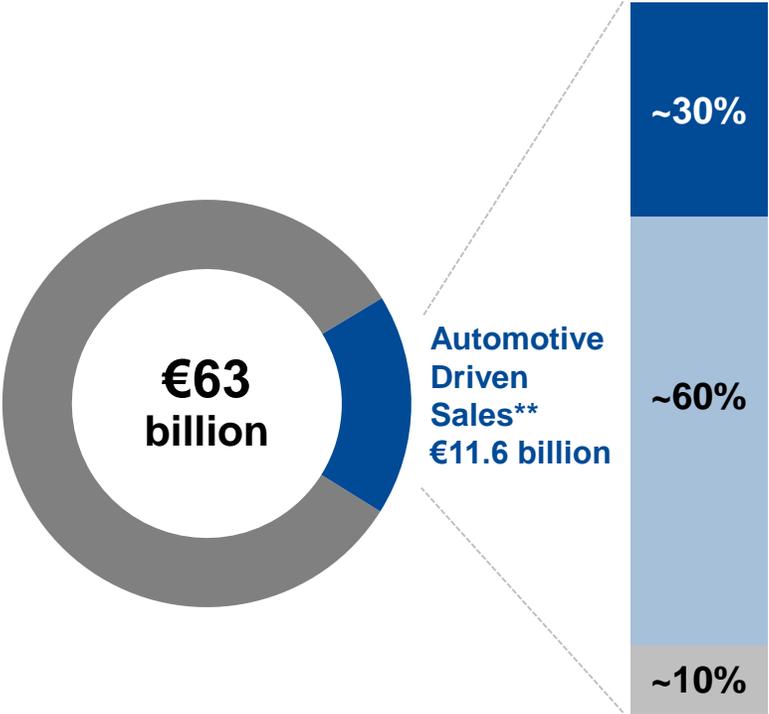
- **Cathode active materials** are key to Lithium-ion battery performance
- BASF poised to **drive trend towards nickel-rich** NCA and NCM (nickel content > 80%)
- **Particle morphology** and **surface modification** are critical performance levers in CAM

BASF's competitive advantage

- **Largest chemical supplier** to automotive industry, unparalleled access and market knowledge
- **Strong technology** and **IP position** in CAM, **powerful portfolio** and **pipeline**
- **Market leader** in high-nickel NCA, strong technology position and business momentum in NCM
- **Global presence** and regional **R&D** and **production capabilities**
- **Financial power** to grow asset base and capitalize on any CAM demand scenario

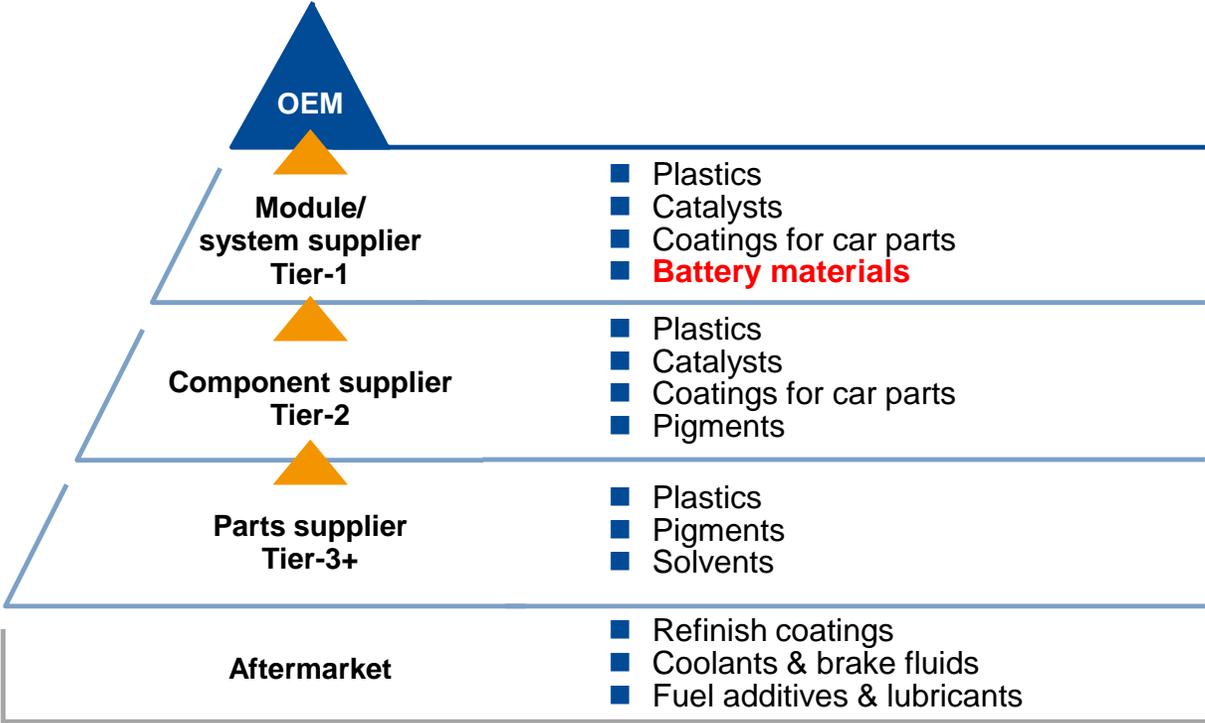
BASF's offering is an unparalleled fit to the whole automotive value chain

BASF Group Sales 2018



Industry structure*

BASF products



* Based on business model, not real supply chain Includes Precious Metals

BASF solutions for your E-Mobility applications

Thermal management

Car body

- NIR-reflective pigments
- NIR-reflective coatings
- Insulation materials

Interior Parts

- NIR-reflective pigments

Electric powertrain

Power electronics

- Thermal conductive plastics (PA, PBT)
- Flame retardant plastics (PA, PBT)
- Hydrolysis-resistant plastics (PBT)
- Cable jacketing (TPU)

Lubricants

- Components for lubricants

NVH

- E-engine mounts (Cellasto)
- Subframe Mounts (Elasturan LS)
- Engine cover (PU – Elastoflex)

Fuel Cell

- End plate, media distribution plate (PA)

Battery packs

Battery cell

- **Cathode active materials (CAM)**
- Anode binders
- Processing Chemicals

Battery modules and packs

- Metal pretreatment chemicals
- Anti corrosive coatings
- Flame retardant plastics (PA, PBT)
- EMI-shielded plastics (PBT)
- Decoupling elements (Cellasto)

Charging infrastructure

Housing and structural parts

- TPU for aesthetics
- Metal pretreatment chemicals
- Anti corrosive coatings
- Flame retardant and halogen free plastics (PA, PBT)

Cable and connectors

- Cable jacketing (TPU)
- Flame retardant plastics (PA, PBT)

Thermal management

- Hydrolysis-resistant plastics (PBT)
- Thermal conductive plastics (PA, PBT)

Thermal management & Power Supply

- Coolants
- Hydrolysis-resistant plastics (PBT)
- Thermal conductive plastics (PA, PBT)

NVH

- HV battery mounts

