

BASF Research Press Conference on December 9, 2021

Sustainability Starts in Research

Dr. Melanie Maas-Brunner Member of the Board of Executive Directors and Chief Technology Officer of BASF SE



We live in a time of tremendous challenges...

We are leaving the comfort zone of our climate system ... and moving into completely uncharted territory.

Dirk Notz, lead author of IPCC Report 2021



...and we live in a time of groundbreaking innovations







Battery materials

Renewable energies

Quantum computing



Innovation is the key enabler for the sustainability transformation



We operate the industry-leading innovation platform



Global expenditures of **~€2 billion** for research and development, world leader in chemical industry

Approximately **10,000** employees worldwide involved in research and development

Around **950** new patents filed in 2020

8 Academic Research Alliances and 245 university cooperations



New setup to benefit our customers and support the transformation towards sustainability



Act faster on rapidly evolving market trends

Cater to differentiated customer requirements

Bundle capabilities to drive innovation

Our purpose leads the way: We create chemistry for a sustainable future



Circular economy

Sustainable solutions







Methane pyrolysis – process innovation to reduce CO₂ emissions



- Test plant at the Ludwigshafen site in trial operation
- Funding granted by German Federal Ministry of Education and Research
- Key challenges are process technology and control
- Methane pyrolysis requires around 80% less electricity than water electrolysis

Gas fermentation for carbon-neutral and circular products





New biodegradable chemistry – significant acceleration of development through digitalization and automation

Understanding the relationship between structure and biodegradability



Development of new tailor-made biodegradable materials





Chemical industry as enabler for the reduction of CO₂ emissions in other sectors

Greenhouse gas emissions 2019 in Germany by sector¹ million metric tons



- Main greenhouse gas emitters are the energy (32%) and industry (23%) sectors
- Sectors such as transportation and agriculture are also significant emitters and important customer industries for BASF
- Products from the chemical industry can make a significant contribution to help decarbonize customer value chains



The transformation of the automotive industry towards electric mobility is in full swing – with significant opportunities for BASF

30% of new cars BEVs¹ and PHEVs by 2030 Light-duty vehicle production volume, million units

Chemical content per car 2.5x higher (by value)²





¹ FCEV: Fuel Cell Electric Vehicle; BEV: Battery Electric Vehicle; PHEV: Plug-in Hybrid Electric Vehicle; Full HEV: Full Hybrid Electric Vehicle; ICE: Internal Combustion Engine **BASF** We create chemistry

12 ² Including metals

BASF innovations enable electric mobility in various applications





Agriculture depends on innovations that protect the environment and address societal expectations

+2 billion

increase of world population by 2050

Limitations

on arable land¹

¹ World Bank: hectares per person 1994–2016: -23% ² FAO 50% higher

productivity in farming required in 2030²

BASF We create chemistry



From individual products to holistic system solutions – creating the best offer for our customers in agriculture



BASF's R&D team is committed to helping our customers become more sustainable.

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