BASF’s new Verbund site in Zhanjiang

Dr. Martin Brudermüller
Chairman of the Board of Executive Directors

BASF Investor Update, September 27, 2021
Cautionary note regarding forward-looking statements

This presentation contains forward-looking statements. These statements are based on current estimates and projections of the Board of Executive Directors and currently available information. Forward-looking statements are not guarantees of the future developments and results outlined therein. These are dependent on a number of factors; they involve various risks and uncertainties; and they are based on assumptions that may not prove to be accurate. Such risk factors include those discussed in Opportunities and Risks on pages 158 to 166 of the BASF Report 2020. BASF does not assume any obligation to update the forward-looking statements contained in this presentation above and beyond the legal requirements.
The new Verbund site in Zhanjiang

1. Market environment in China – a robust basis for growth
2. BASF performance in Greater China – a proven track record
3. Zhanjiang – the location of our new Verbund site in South China
4. The new Verbund site – highly integrated and sustainable
5. Financials and key takeaways
China is the major growth driver for global chemical production: Two thirds of growth will come from Greater China by 2030

Real chemical production\(^1\)

<table>
<thead>
<tr>
<th>Region</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>South America</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Middle East, Africa</td>
<td>0.6</td>
<td>0.8</td>
</tr>
<tr>
<td>Rest of Asia Pacific</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>North America</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Europe</td>
<td>1.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Greater China</td>
<td>0.1</td>
<td>5.6</td>
</tr>
</tbody>
</table>

CAGR 3.3%

Share of absolute chemical production growth by region

<table>
<thead>
<tr>
<th>Region</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>South America</td>
<td>2%</td>
</tr>
<tr>
<td>Middle East, Africa</td>
<td>4%</td>
</tr>
<tr>
<td>Rest of Asia Pacific</td>
<td>13%</td>
</tr>
<tr>
<td>North America</td>
<td>6%</td>
</tr>
<tr>
<td>Europe</td>
<td>8%</td>
</tr>
</tbody>
</table>

Greater China 68%

Source: BASF \(^1\) Real chemical production excluding pharmaceuticals, US$ base year 2015

Figures may not add up due to rounding effects.
The absolute growth of the chemical market in China is expected to be twice as high as in the rest of the world.

Absolute growth of chemical market 2020–2030

<table>
<thead>
<tr>
<th>Region</th>
<th>Growth (billion US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South America</td>
<td>31</td>
</tr>
<tr>
<td>North America</td>
<td>90</td>
</tr>
<tr>
<td>EMEA (excl. mainland China)</td>
<td>183</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>205</td>
</tr>
<tr>
<td>Mainland China</td>
<td>1,026</td>
</tr>
</tbody>
</table>

Source: BASF \(^1\) Real chemical production excluding pharmaceuticals, US$ base year 2015
Maps for illustrative purposes only
Economic drivers for long-term growth in China remain unchanged despite the impact of the pandemic

- China will continue to **strive to achieve a per capita GDP level similar to advanced economies**
- Continuing urbanization will drive **increasing demand for durable and consumable goods**
- **Productivity increases** will drive growth
- There will be **high investments in new technologies, sustainability and high value-add industries**

**GDP per capita**
2020 estimates, thousand US$

- USA: 63
- Germany: 45
- UK: 40
- Japan: 40
- South Korea: 32
- China: 10

Source: BASF, nominal
China’s 14th five-year plan and policy initiatives add momentum to BASF’s strategy implementation in China

China’s GDP growth: Consumption-driven%

BASF is well positioned to benefit from business opportunities in China
- Customer-driven innovations
- Sustainability front-runner
- Local asset and R&D footprint
- Proven track record and strong relationships

Five-year plan: Self sufficiency and sustainability

Data source: Oxford Economics, calculation based on real 2015 values
Today, 90% of BASF’s production assets are in East China, in South China the company is still under-represented.

Key BASF figures in Greater China:
- BASF is active in China since 1885.
- Over the past 20 years, BASF has invested more than €6 billion in Greater China (more than €9 billion with partners).
- Number of companies: 28 major wholly-owned, 7 major joint ventures.
- Number of production sites: 27.
- Number of sales offices: 24.
- Number of employees: 8,948.
- Sales of BASF Group companies to customers in Greater China in 2020: ~€8.5 billion.

All data for Greater China is as of December 31, 2020. Sales of fully consolidated companies only; does not include sales of joint ventures consolidated at equity such as BASF-YPC Company Ltd. (BASF-YPC). EBIT before special items incl. equity contribution from BASF-YPC. Gross asset value and production capacity incl. BASF-YPC.
Guangdong is home of key customers from fast-growing industries

**CAGR 2015–2020**

**% p.a.**

- Strongly growing industrial base\(^1\) billion US$
  - 671
  - 2020

- Largest automotive production, China # of motor vehicles built in Guangdong (1,000)
  - 3,133
  - 2020

- Large chemical production\(^2\) billion US$
  - 151
  - 2020

- Steady increase of private consumption\(^3\) billion US$
  - 611
  - 2020

**Market characteristics**

- Around 126 million residents in Guangdong province (2020)\(^4\)
- GDP Guangdong (2020): ~US$1,608 billion (closely trailing South Korea)
- Key customer industries: transportation, consumer goods, home and personal care, electronics
- Chemical products are generally undersupplied from local production

---

\(^1\) Real value added, manufacturing Guangdong

\(^2\) Real chemical production Guangdong; inferred by gross output/value added ratio for China

\(^3\) Real private consumption Guangdong; IHS forecast

\(^4\) General Office of Shenzhen Municipal People’s Government
Guangdong province is the economic growth engine of China and a powerhouse of BASF’s key customer industries

GDP 2020, growth until 2030 and 2050

<table>
<thead>
<tr>
<th>Country</th>
<th>2020</th>
<th>2030</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jiangsu province</td>
<td>1,491</td>
<td>1,139</td>
<td>3,147</td>
</tr>
<tr>
<td>Guangdong province</td>
<td>1,608</td>
<td>1,213</td>
<td>3,673</td>
</tr>
<tr>
<td>Germany</td>
<td>3,409</td>
<td>650</td>
<td>1,011</td>
</tr>
</tbody>
</table>

By 2050, GDP of Guangdong is expected to add more than “one current Germany”

Light vehicle production in South China and Germany

<table>
<thead>
<tr>
<th>Year</th>
<th>Guangdong</th>
<th>Rest of South China</th>
<th>South China</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>8,000</td>
<td>7,800</td>
<td>7,500</td>
<td>4,000</td>
</tr>
<tr>
<td>2018</td>
<td>7,900</td>
<td>7,700</td>
<td>7,400</td>
<td>3,900</td>
</tr>
<tr>
<td>2019</td>
<td>7,800</td>
<td>7,600</td>
<td>7,300</td>
<td>3,800</td>
</tr>
<tr>
<td>2020</td>
<td>7,700</td>
<td>7,500</td>
<td>7,200</td>
<td>3,700</td>
</tr>
<tr>
<td>2021</td>
<td>7,600</td>
<td>7,400</td>
<td>7,100</td>
<td>3,600</td>
</tr>
<tr>
<td>2022</td>
<td>7,500</td>
<td>7,300</td>
<td>7,000</td>
<td>3,500</td>
</tr>
<tr>
<td>2023</td>
<td>7,400</td>
<td>7,200</td>
<td>6,900</td>
<td>3,400</td>
</tr>
<tr>
<td>2024</td>
<td>7,300</td>
<td>7,100</td>
<td>6,800</td>
<td>3,300</td>
</tr>
<tr>
<td>2025</td>
<td>7,200</td>
<td>7,000</td>
<td>6,700</td>
<td>3,200</td>
</tr>
<tr>
<td>2026</td>
<td>7,100</td>
<td>6,900</td>
<td>6,600</td>
<td>3,100</td>
</tr>
<tr>
<td>2027</td>
<td>7,000</td>
<td>6,800</td>
<td>6,500</td>
<td>3,000</td>
</tr>
</tbody>
</table>

Already today, South China produces more light vehicles than Germany

Source: IHS and LMC ¹ Growth by 2030 and by 2050 respectively
The new Verbund site in Zhanjiang

1. Market environment in China – a robust basis for growth

2. BASF performance in Greater China – a proven track record

3. Zhanjiang – the location of our new Verbund site in South China

4. The new Verbund site – highly integrated and sustainable

5. Financials and key takeaways
BASF has substantially increased its presence in Greater China

As of December 31, 2020. Sales by location of customer of globally consolidated companies (excl. BASF-YPC)
Depicted view of mainland China.
BASF’s Verbund site in Nanjing is a prime example of our success in China

- Scope has **continuously expanded** over the years towards longer and more diversified value chains
- **Third-largest BASF site**, US$5.8 billion gross investment (100%)
- Capacity: ~3 million metric tons per year; **33 production plants** including steam cracker
- Strong focus on operational excellence and consistent plant maintenance resulted in **best-in-class asset effectiveness**
- With **23% EBITDA margin**\(^1\) BASF-YPC is one of the most profitable BASF sites

---

\(^1\) Average 2015–2020
BASF’s growth and profitability targets require a strong position in Greater China

Greater China is the growth engine for BASF

BASF’s volume growth in Greater China

CAGR 2015–2020: 9%

Increase EBITDA before special items by 3% to 5% per year

EBITDA\(^1\) before special items growth in Greater China

CAGR 2015–2020: 26%

Grow sales volumes faster than global chemical production every year

CAGR 2015–2020:

\(^1\) Restated figures due to reporting of construction chemicals as discontinued operation. Not included: BASF-YPC as BASF’s share is accounted for at-equity. Depicted view of mainland China
The new Verbund site in Zhanjiang

1. Market environment in China – a robust basis for growth
2. BASF performance in Greater China – a proven track record
3. Zhanjiang – the location of our new Verbund site in South China
4. The new Verbund site – highly integrated and sustainable
5. Financials and key takeaways
Location in Zhanjiang enables BASF to capture long-term profitable growth in the fastest growing chemical market worldwide

- **Customers**: Proximity to the economic centers of China’s fastest growing province Guangdong; shortest sea routes to Southeast Asia
- **Excellence in production**: Integrated Verbund platform, cutting edge technologies, smart solutions, deep seaport, world-class logistics
- **Developing downstream value chains**: BASF will focus on products that are in high demand, with options for further expansion
- **Differentiating from competitors beyond products**: Front-runner position in sustainability and circular economy
- **Leveraging industry ecosystems**: BASF will benefit from collaborations with neighbors and government incentives
- **Foreign trade advantages**: Guangdong province intends to set up Donghai Island as a free trade zone
The new Verbund site in Zhanjiang

1. Market environment in China – a robust basis for growth
2. BASF performance in Greater China – a proven track record
3. Zhanjiang – the location of our new Verbund site in South China
4. The new Verbund site – highly integrated and sustainable
5. Financials and key takeaways
Targets and framework conditions for the new BASF Verbund site in Zhanjiang

- **100% BASF ownership** of core Verbund assets
- **High profitability and competitiveness** through world-scale plants
- **World-scale steam cracker** with **flexibility** for major feedstocks
- Building **long, multi-step and diversified value chains** (C2, C3, C4)
- Deployment of **smart and innovative technologies** to set a new benchmark for **sustainability** and **digitalization**
- **Expansion space** for further investment phases
Main construction phases of the new Verbund site – stepwise approach

**Initial phase**
- on stream: 2022–2023

**First downstream plants:**
Performance Materials for automotive and consumer industries

**Phase 1**
- start-up: as of 2025

Heart of the Verbund:
- **Petrochemicals plus further downstream plants**

**Phase 2**
- start-up: as of 2028

Verbund expansion and diversification

**Key customer industries**
- Transportation
- Electronics
- Consumer goods
- Health and nutrition

---

**Engineering plastics and thermoplastic polyurethanes**

**Steam cracker**
- C2 value chain
- C3 value chain
- C4 value chain

**Additional downstream plants**

Production plants of the initial phase can operate without integration, while phase 1 and 2 will form the foundation for the development of the BASF Verbund site.
First downstream plants are expected to be operational by 2022 and 2023

- The official start of construction began in less than two years from the signing of the Memorandum of Understanding.
- The first plants will produce engineering plastics and thermoplastic polyurethanes such as
  - Ultramid®
  - Ultradur®
  - Elastollan®
- These products are in strong demand, particularly in the automotive and consumer goods industries.
### BASF’s new Verbund site will offer a broader and more diversified downstream product portfolio than competition

<table>
<thead>
<tr>
<th>Product Group 1</th>
<th>Company 2</th>
<th>BASF-YPC Nanjing</th>
<th>BASF Zhanjiang</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyethylene</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Ethylene oxide</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Nonionic surfactants</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Methyltri glycol</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Styrene monomer</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Standard amines</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Propionic acid</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Specialty amines</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Propylene oxide</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Glacial acrylic acid</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Superabsorbents</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Oxo-C4</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>n-Butyl acrylate</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>2-Ethylhexyl acrylate</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Neopentyl glycol</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Higher carboxylic acids</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Polyisobutylene</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Isononanoic acid</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Tridecanol N</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>C9-aldehyde</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>2-Propylheptanol</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>Citral</td>
<td>A B</td>
<td>● ● ● ● ●</td>
<td>● ● ● ● ●</td>
</tr>
</tbody>
</table>

Source: BASF and externally published information; products at Zhanjiang subject to final approval

1. Selected product lines of major refineries/petrochemical sites in Guangdong province
World-scale Verbund site with diversified value chains

Butane / Naphtha cracker
Ethylene capacity: ~1,000 kt p.a.

C2 value chain
- Ethylene oxide
  - HDPE ~500 kt
- Nonionic surfactants ~220 kt
- Ethylene glycol ~800 kt

C3 value chain
- Acrylic acid
  - 2-Ethylhexyl acrylate ~100 kt
- Butyl acrylate ~400 kt
- Neopentylglycol ~80 kt

Oxo-C4
- HDPE ~500 kt
- HDPE ~500 kt

C4 value chain
- Citral
- Menthol¹
- Linalool¹
- Propionic aldehyde
- Methyl glycols
- Standard amines
- Specialty amines

Operating divisions
- Petrochemicals
- Intermediates
- Care Chemicals
- Nutrition & Health

Phase 1
- Butane / Naphtha cracker
- Ethylene
capacity: ~1,000 kt p.a.

Phase 2
- C2 value chain
- C3 value chain
- C4 value chain

¹ At Ludwigshafen site
Capacity figures are nameplate and indicative. Projected set-up is subject to final approval.
BASF’s Zhanjiang Verbund site will have the lowest projected CO₂ footprint in the world

Projected BASF CO₂ emissions of Verbund site in South China

6–9

4.2

Cracker Verbund Integration

Syngas incl. CO₂ recycling

Power supply rest of site Renewable energy

Renewable energy

1.8

Phase 1 full start-up

2030

2050 net zero

Transformation to net zero 2050

Coal-powered petrochemical site of similar scope

Gas-powered petrochemical site

Cracker eDrive

Power supply

Renewable energy

6–9

4.2
Our unique process concepts will significantly reduce carbon emissions compared to state-of-the-art technologies

**BASF Group levers**

- **Grey-to-green**
  - Renewable power, instead of conventional power plant based on natural gas or coal

- **Power-to-steam**
  - Electricity (eDrives), instead of steam-driven turbines for compressor machines in the cracker
    - Avoids on-purpose steam production via boilers run by fossil-fuel energy
    - Enables equilibrium in the steam balance for the entire Verbund

- **New technologies**
  - Syngas produced from CO₂ off-gas from ethylene oxide process and excess hydrogen from production

- **Continuous opex**
  - Excess steam to preheat air in the cracker furnaces increasing the overall system efficiency

- **Verbund advantage**
  - Fuel gas released by new air preheating process as second feedstock for syngas production
  - Excess gas streams as raw materials for production instead of thermal usage

**Specific measures at the new Verbund site to reduce CO₂ emissions by more than 50%**
CO₂ reduction via renewable direct power-purchase mechanism – an unprecedented step in Guangdong province

- Until 2020, a renewable direct power-purchase (R-DPP) policy did not exist in Guangdong
- BASF successfully unlocked R-DPP policy change in 2021 with strong government support
- **Initial phase (10 MW):** 100% renewable energy contracted with CR-Power
- **Phase 1 and 2 (>400 MW):** 100% renewable energy targeted by 2030

BASF is the first company to purchase renewable energy under the new pilot trading rules in Guangdong province.
The new Verbund site in Zhanjiang

1. Market environment in China – a robust basis for growth
2. BASF performance in Greater China – a proven track record
3. Zhanjiang – the location of our new Verbund site in South China
4. The new Verbund site – highly integrated and sustainable
5. Financials and key takeaways
Key financials of BASF’s new Verbund site in Zhanjiang

Projected key financials by 2030

- **€4.0–5.0 billion** sales
- **€1.0–1.2 billion** EBITDA
- **€8.0–10.0 billion** total capital expenditures (peak: 2023–2025)

- The greenfield character of the new Verbund site results in a higher share of infrastructure investments compared with a brownfield project
- Infrastructure investments will be diluted with future investments/expansions
- The new Verbund site will be BASF’s key platform for long-term profitable and sustainable growth in China even beyond phase 1 and phase 2
BASF Group: High capex discipline in ongoing business to support investments in growth projects

Capex budget by type of investment
billion €, 2021–2025

- Investments in ongoing business
- Growth projects: Zhanjiang Verbund site and battery materials

- Average capex ~€2.6 billion p.a.
- Average capex ~€2.0 billion p.a.

- Growth project: Zhanjiang Verbund site
  - €22.9 billion, thereof €3.6 billion in 2021
- Growth project: battery materials

Investments in ongoing business
BASF’s new Verbund site in Zhanjiang: Key takeaways

China’s macroeconomic environment is robust and develops towards more self-sufficiency and sustainability.

Guangdong province is the economic growth engine of China and a powerhouse of BASF’s key customer industries.

BASF is very well positioned to capture future growth in China by leveraging its unique Verbund know-how and longstanding relationships.

BASF has a proven track record of strong top line and earnings growth in Greater China.

The new Verbund site will be a key platform for long-term profitable and sustainable growth of BASF Group.
We create chemistry