



BASF

We create chemistry

Verbund at its core: New acetylene plant

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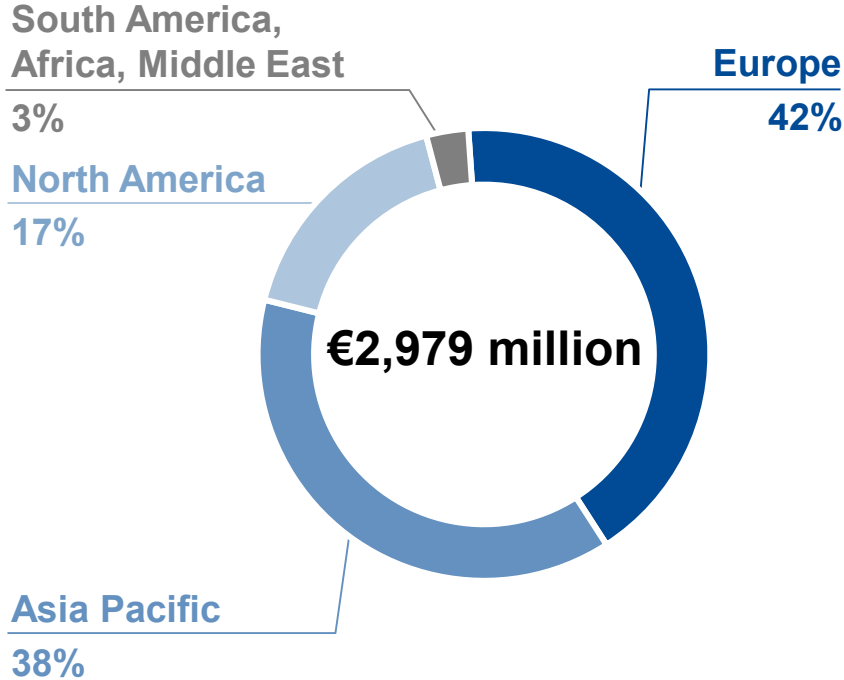
Cautionary note regarding forward-looking statements

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 the Opportunities and Risks Report from page 111 to 118 of the BASF Report 2017. BASF does not assume any obligation to update the forward-looking statements contained in this presentation above and beyond the legal requirements.

Intermediates division

Four product groups serve a wide variety of customers and industries

Sales by location of customer 2017
(sales to 3rd parties)



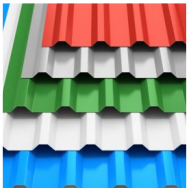
Amines
40%*



Butanediol and derivatives
25%*

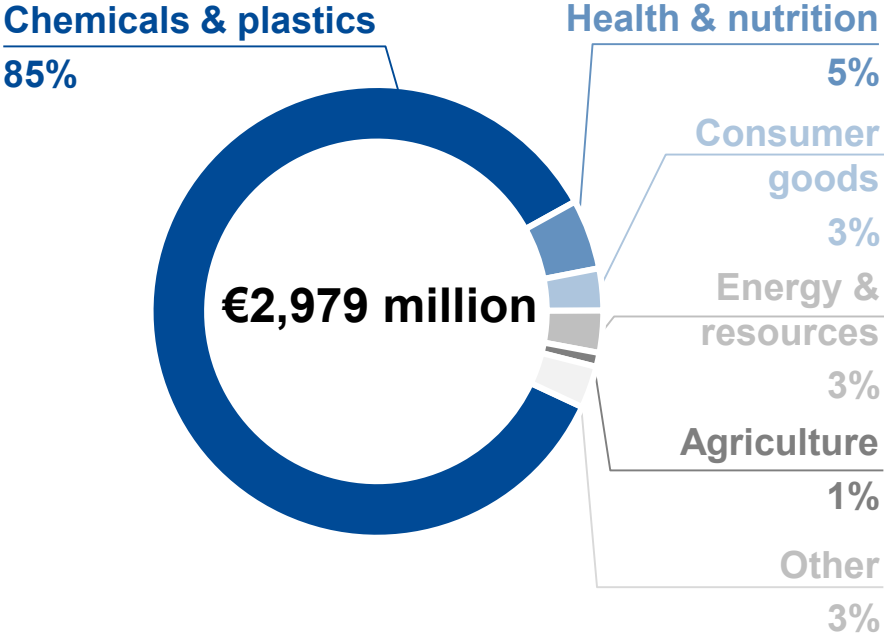


Acids and polyalcohols
20%*



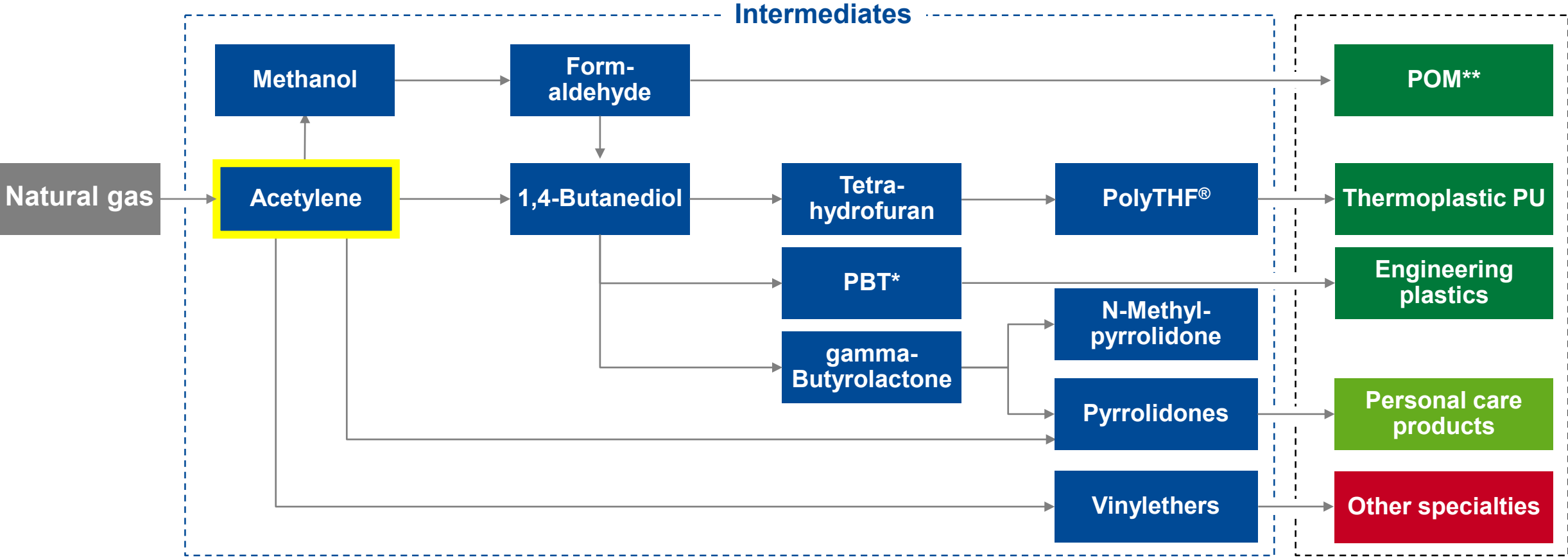
Acetylenics and carbonyl derivatives
15%*

Sales by first customer industry 2017
(sales to 3rd parties)



The acetylene value chain

Integral part of the BASF Verbund, providing raw materials for a variety of businesses



The acetylene value chain

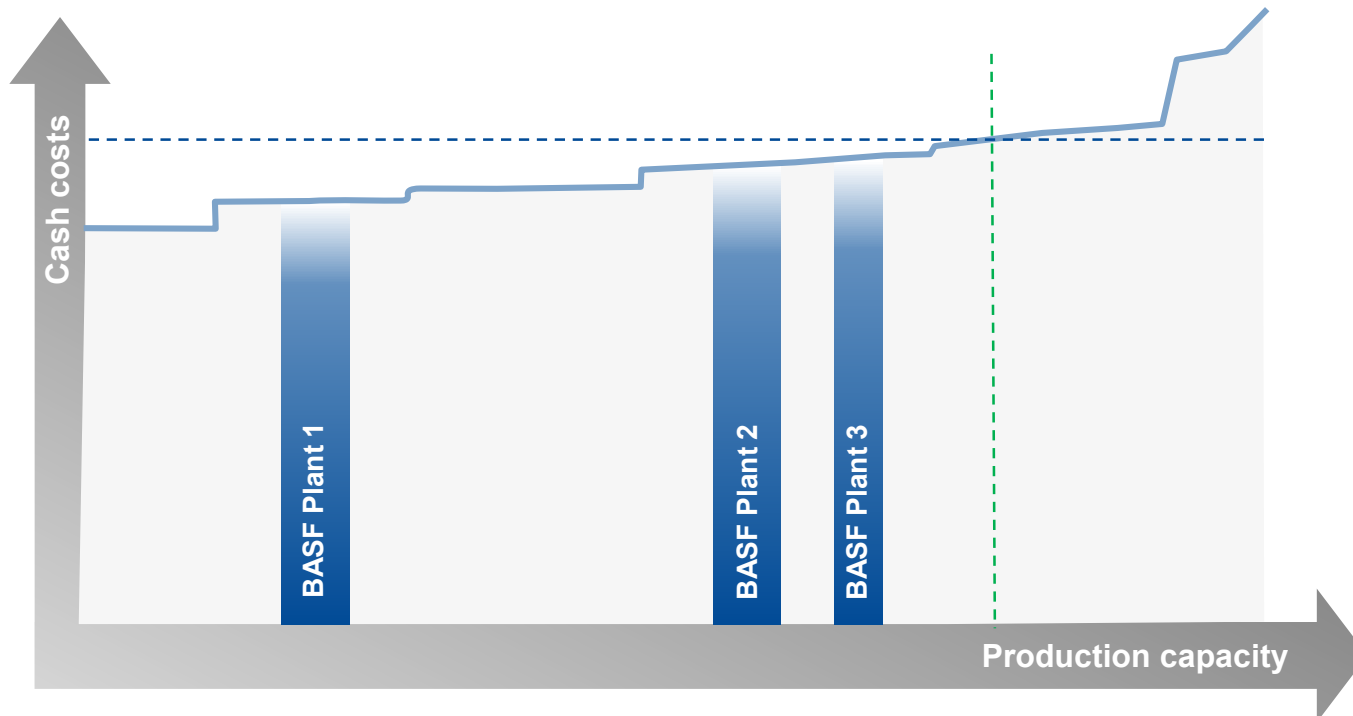
These materials are linked to attractive markets and applications



Technology leadership

We strive for continuous cost improvements along the entire value chain

1,4-Butanediol cash cost curve, Asia
(average cash costs, 2017)



- More than **80 years of experience** in acetylene-based chemistry
- **Technological leadership** on all steps of the value chain, e.g., acetylene, BDO, PolyTHF®
- Investment in **cost-competitive plants**
- Strong integration into **Verbund**
- **Continuous R&D efforts** to improve processes and incorporate them into existing and new assets

From the old to the new acetylene plant

Consistent implementation of clear rationale

Objective

- Safe and reliable continuation of acetylene production in Ludwigshafen with favorable and long-term sustainable cash cost position

Motivation for project

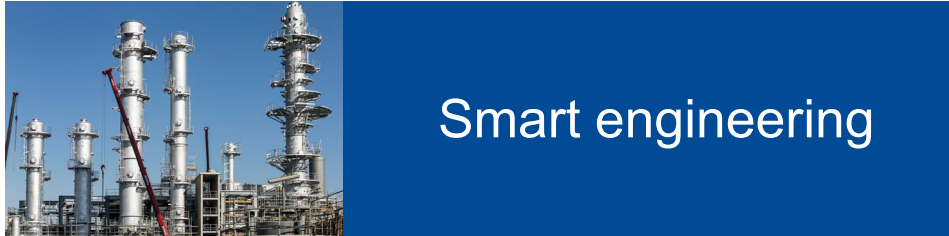
- Ensure sustainable, safe and reliable operation
- Achieve significantly better cost position
- Utilize downstream capacities at our Ludwigshafen site to the fullest extent possible
- Equip the value chain for future growth of acetylene specialties

Project scope

- Replacement of the existing plant with an extended capacity
- New acetylene plant in Ludwigshafen based on BASF's proven water quench technology

A truly digital plant

Incorporating elements of digitalization from the design phase on



Smart engineering

Advanced engineering tools

- + Augmented 3D plant modeling
- + Increased installation quality
- + Superior first pass installation ratio

Engineering data management

- + Higher resolution plant data
- + Consistent data over the plant lifecycle
- + Additional quality of process improvements



Smart operation

Predictive maintenance

- + Performance monitoring of critical assets
- + Optimized maintenance scheduling
- + Reduced instrument inventories

Augmented reality in production

- + Workforce efficiency and effectiveness
- + Higher asset utilization
- + Knowledge transfer and preservation

Replacement of the acetylene plant

An important cornerstone for Ludwigshafen



- Construction was started in the first quarter of 2017
- **Replacement** of an **existing production plant** which has less capacity
- **Startup** expected for **end of 2019**
- Combination of 440 individual plant components
- The **world-scale asset** will have an annual production design capacity of **90,000 metric tons**
- 20 plants utilize acetylene as feedstock
- Deep integration into **Verbund** structure of Ludwigshafen

Key takeaways

The new acetylene plant continues our legacy



Investments **close to our customers**



Operation of **optimized assets** and lean business models



Realization of **synergies** via deep **Verbund** integration



Cost competitiveness through continuous **innovation**



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