BASF
We create chemistry

Smart Verbund for the Future
BASF Guangdong Verbund site

Zhanjiang, China

About this brochure
The "Smart Verbund for the Future - BASF Guangdong Verbund site" is a brochure published to brief the overall information of BASF's investment project in Zhanjiang, Guangdong province, China, to our customers and partners. The brochure will be updated along with the progress of the project.

← **Cover image:** Experiencing future smart manufacturing with VR glasses

On this page: People wrote their wishes for the future smart Verbund site on the memorial pile at the piling ceremony of BASF Guangdong Verbund site (Initial Phase) on May 30, 2020

Welcome

Letter to customers and partners

Dear customer and partner,

Today, the world is changing more rapidly than ever before, driven by demographic changes and new digital technologies, as well as the unprecedent coronavirus pandemic situation. We, from different industries and regions, are facing diverse social and environmental challenges due to limited natural resources, climate change and the increasing demands of a growing global population. Chemistry is key to solving many of these challenges. By combining our unique expertise with your competences, we can jointly develop profitable, innovative and sustainable solutions for these global challenges.

Despite the economy downturn, Asian market still plays as a driving force in the global chemical market growth. China's fast-growing chemical industry has been the largest in the world by revenue since 2011, and its growth rate continues to outpace by far other major chemical-producing regions, expecting to account for about half of the global chemical production by 2030. BASF, as the leading chemical company with over 135 years in China, wants to participate in this potential growth.

Guangdong province is a key contributor to the GDP growth in China, yet it is undersupply of high-quality chemicals. Guangdong is also home to fast growing industries in China such as automotive, construction, high-speed railway, electronics & electric, food packaging, home & personal care, aerospace and pharmaceutical, where BASF's products and solutions are widely used. Therefore, we are putting our ever-largest US$10-billion mega investment to build a large integrated chemical complex to be operated under the sole responsibility of BASF in China with location in Zhanjiang city, Guangdong province.

The Verbund concept has been a cornerstone to BASF's success in last 154 years and has constantly evolved and grown with the availability of new technologies. Our new smart Verbund site in Zhanjiang will significantly enhance our presence in this dynamic market by supplying high-quality products and fostering innovation cooperation with our local and international partners. Through this, we aim to facilitate our customers, no matter local or multinational, to manufacture high value-added products more efficiently, sustainably and with high quality.

Until today, this project has been moving forward swiftly. By applying the highest EHS standards, our new Verbund site will be the BASF's most advanced chemical production site globally with cutting-edge technologies. It will also form a solid foundation for a world-class industrial cluster in Zhanjiang which will serve our local and multinational customers and partners in a better manner to radiate to South China and other Asian countries into the future.

Dear customers and partners, with this brochure, we provide you an overivew of BASF Guangdong Verbund site project at a glance. I wish you a good reading.

Klaus Welsch

Dr. Klaus Welsch
President, Mega Projects Asia, BASF

BASF Guangdong Verbund site is under construction on Donghai Island of Zhanjiang City

BASF Guangdong Verbund site at a glance

In November 2019, BASF officially launched its new smart Verbund project in Zhanjiang, Guangdong province and commenced preparations to build its first plants. Announced in July 2018, the project would be BASF's largest investment with up to US$10 billion upon completion and would be operated under the sole responsibility of BASF. The site would ultimately be the third-largest BASF site worldwide, following Ludwigshafen, Germany, and Antwerp, Belgium.

The new smart Verbund site will include a steam cracker with a capacity of 1 million metric tons of ethylene per year and plants for consumer-oriented products. By utilizing the latest digital technologies and applying the highest safety standards, the site will adopt a smart manufacturing concept based on cutting-edge technologies, and will utilize automated packaging, high-tech control systems and automated guided vehicles.

The site will be built in phases. The first plants will produce engineering plastics and thermoplastic polyurethane (TPU), the first plant is scheduled to be operational by 2022 to serve the increasing needs of various growth industries in South China and throughout Asia. The whole Verbund site is planned to be completed by 2030.

Smart Verbund for the Future

Growing in and with China, the largest chemical market in the world

1969
First production

2004
First plant started operation in Shanghai Chemical Industrial Park

2005
Inauguration of Nanjing Verbund site

2010
Expansion of Nanjing Verbund site

2014
Expansion of acrylic acid production at Nanjing Verbund site

2015
Inauguration of Chongqing MDI complex
Inauguration of Maoming site

2019
Commencement of BASF Guangdong Verbund site project

1850s | **1960s** | **2000s** | **2010s** | **2020s**

1885
First entering the China market

2009
Establishment of BASF Nanjing site

2012
Inauguration of Innovation Campus Shanghai

2019
Expansion of Innovation Campus Shanghai: launch of Automotive Application Center and the Process Catalysis R&D Center

Smart Verbund for the Future

Project milestones of BASF Guangdong Verbund site

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July 9
MoU signed in Berlin

March 29
BASF opened new liaison office as next step in development of planned "Verbund" chemical production site in Zhanjiang, China

May 21
Announced to build engineering plastics and thermoplastic polyurethanes plants as the first plants

May 30
Started piling of the first plants

2018 **2019** **2020**

January 10
Framework Agreement signed in Ludwigshafen

April 30
BASF Integrated Site (Guangdong) Co. Ltd. (BIG) officially founded

November 23
Official commencement of the project

The project will support rapidly-growing industries in Guangdong

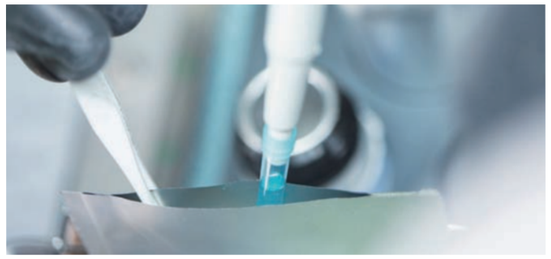
Guangdong and South China markets need innovative solutions for multiple industries

Guangdong is home to fast growing industries in China such as automotive, construction, high-speed railway, electronics & electric, food packaging, home & personal care, aerospace and pharmaceutical. BASF's products and solutions are widely used in these industries and our new Verbund site in Guangdong will significantly enhance our presence in this dynamic market by supplying high-quality products and fostering innovation cooperation with both local players and multinationals.

Personal Care

High-speed Railway

Automotive



Electronic and Electric

Construction

Aerospace

Food Packaging

Pharmaceutical

Integrated to BASF's extensive network in Greater China

Some sites are not shown due to scale. All figures refer to BASF entities fully consolidated according to IFRS 10/11.
Map NO. GS(2016)2923

Mainland China, Hong Kong, Taiwan

Wholly owned subsidiaries: **28**	Joint ventures: **9**
Production sites: **29**	Sales offices: **24**
Employees (as of December 31, 2019): **9,230**	Sales in 2019 (by location of customer): more than **€ 7.3 billion**

Zhanjiang, the start of Guangdong's marine Silk Road

Zhanjiang is located at the heart of southwestern Guangdong, China. Although not as well known as some other cities in China, Zhanjiang is truly a vibrant, cosmopolitan city, with more than 8 million residents. Zhanjiang has abundant natural resources, an excellent deep-water port and other transportation links, and an engaged, educated workforce. It is also a city with a long history – it was an early departure point on the Maritime Silk Road.

Importantly, Zhanjiang is the right location for us to serve customers in Guangdong Province. Guangdong is home to key customer industries for BASF, like transportation, consumer goods, and electronics. With more than 110 million residents, and annual GDP growth of 7%, it is one of the fastest-growing markets for innovations from chemistry.

Creating a sustainable future for Zhanjiang with a world-class chemical cluster

BASF Guangdong Verbund site is located in the Zhanjiang Economical & Technological Development Zone (hereafter as ZETDZ) on Donghai Island in Zhanjiang city. ZTEDZ is the first batch of National Economical & Technological Development Zones established with the approval of the State Council in November 1984. ZTEDZ manages one of the largest national economic and technological zones in China.

In addition to BASF Guangdong Verbund site project, there are also two other major projects on Donghai Island – Zhongke Refining and Petrochemical Complex and BaoSteel Zhanjiang Steel Project. BASF is joining hands with the two neighbors as well as other enterprises to help ZETDZ accelerate the construction of a world-class port-based industrial base, exert the magnetic effect to cultivate and develop the port-based industrial cluster, and jointly build a world-class chemical cluster to create a sustainable future for Zhanjiang.

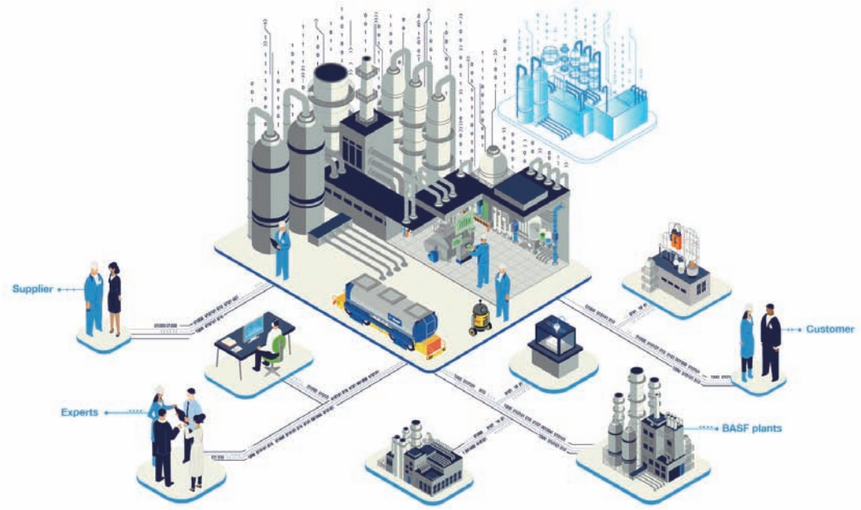
A “smart Verbund” drives innovation and sustainable development

The new Verbund site will be the first large scale Verbund project with full digitalization and implementation of smart manufacturing in the world. At this site, a smart manufacturing concept will be based on cutting-edge technologies that maximize efficiency and reduce environmental impact. This is in line with Zhanjiang's own commitment to sustainable development, as well as BASF's global strategy. BASF will take an environment, health and safety approach that is in line with BASF's global standards, while following local laws and regulations.

At the same time, BASF is taking advantage of many digital innovations to realize new opportunities. Fully integrated production plants from upstream to downstream with Verbund synergies will be enhanced by digital tools to support local and multinational champions to increase transparency and enable enhanced decision-making processes. Big data analysis and real-time monitoring will optimize energy consumption, reduce waste and improve plant reliability. Technology such as augmented reality, automated vehicles, robotics and fully digital integrated operations will enhance process and workforce efficiency as well as safety performance.

And by applying the highest safety standards, the new Verbund site will be a role model for sustainable production contributing to the development of a circular economy in China.

Safer and more competitive operations through smart manufacturing



Logistics Automation

Digital Plant

Augmented Reality

Predictive Maintenance

Innovative solutions support local industries

The new smart Verbund site in Zhanjiang in Guangdong province will significantly enhance our growth potential in this dynamic market. It will also support quality transformation of the key industries in Guangdong and South China. Our customers based in South China would in the future be supplied from this smart Verbund site. The locally produced solutions enable development of innovations from South China. With our high value-added products with proprietary technology, BASF is able to serve our customers from industries including automotive, construction, high-speed railway, electronic & electric, food packaging, home and personal care, aerospace and pharmaceutical. By leveraging close cooperation with local champions and global customers, customers will benefit from BASF's deep industry and application expertise from around the world.

BASF Corporate Commitments

BASF is dedicated to contributing to a world that provides a viable future with enhanced quality of life for everyone. We do so by creating chemistry for our customers and society and by making the best use of available resources. Sustainability is at the core of what we do, a driver for growth as well as an element of our risk management. For example, we have defined sustainability focus areas within our corporate strategy. These formulate the commitments with which BASF positions itself in the market and how it aims to meet the growing challenges along the value chain.

Suppliers

We source responsibly

As a global business, we have a responsibility to manage our supply chain carefully. We connect with our suppliers to source responsibly. Our partnerships with suppliers are based on mutual value creation, as well as a reliable supply of raw materials, technical goods and services at competitive prices.

BASF operations

We produce safely for people and the environment.

We produce efficiently.

Our global safety and security concepts serve to protect our employees, contractors and neighbors as well as to prevent property and environmental damage and protect information and company assets. Operational excellence is key to outperforming the competition sustainably, long-term. We are connecting across BASF to operate in the most efficient way possible.

Customers

We drive sustainable solutions.

A growing need for food, energy and clean water for a growing world population, limited resources and protecting the climate – innovations based on chemistry play a key role for these challenges, as they contribute decisively to new solutions and business models which enable decoupling growth from the consumption of finite resources. Effective and efficient research and development is a prerequisite for innovation as well as an important growth engine for BASF.

And along the way...

We value people and treat them with respect.

We value people and treat them with respect. Engaged and empowered employees are key to our success. We are connecting across our business and industry to create good relationships with our partners and stakeholders. With our solutions and responsible business conduct, we want to contribute to a better quality of life for everyone.

Verbund operations reduce environmental impact and contribute to sustainability

Geismar

Antwerp

Ludwigshafen

Nanjing

Kuantan

Freeport

Zhanjiang (under construction)

Combined heat and power plants and integrated energy Verbund prevented

6.4 million tons of CO_2 emissions in 2019

Synergies in logistics and infrastructure, minimization of waste

Smart Verbund for the Future

Global network links production and R&D worldwide

At our new smart Verbund site, our production will link to BASF's global network with around 350 sites worldwide to bring together our expertise in high performance, quality control and efficiency. It will also have very close network with our Innovation Campus Shanghai and other R&D centres worldwide. With approximately 11,000 R&D employees at 70 locations globally, we work on sustainable solutions for our customers every day. This will also create global opportunities for local and international talent pool, which ensures that we have the best team to serve our customers in Zhanjiang.

Social engagement

With the United Nation's Sustainable Development Goals (SDGs) as guiding principles, BASF is bringing its social engagement activities to contribute to solving current and future social challenges. We continue our commitment to supporting a better quality of life in the communities around our sites, setting up learning opportunities, and creating a long-term impact.

Our stakeholder and community engagement
- Dialog with local communities through Community Advisory Panels
- Good Neighbor Program supporting neighboring communities
- Stakeholder dialog with Chinese NGOs

Since the kick-off of our smart Verbund project in Zhanjiang, BASF already started to bring the concept of social responsibilities and sustainable development to Zhanjiang. On the basis of social environmental due diligence, various measures are taken to actively integrate into the community and assume due responsibilities in all aspects of the economy, society and environment.

In 2019, BASF actively engaged in various initiatives to promote general science knowledge in Zhanjiang. BASF also launched the Good Neighbor Program and conducted first safety classes in the local elementary school. During the Mid-Autumn Festival, we delivered warmth to the elderly in Donghai Island Nursing Home and the Five-Guarantee households. With the outbreak of COVID-19 in the beginning of 2020, we mobiled fast to donate protective equipment to Zhanjiang Economic and Technological Development Zone. To bridge a two-way communication between BASF and local community, in May 2020, we started recruiting members from the local community and very soon officially kicked off the BASF Zhanjiang Community Advisory Panel in Aug. 2020 to build up this important communication platform.

The piling moment of BASF Guangdong Verbund site (Initial Phase)

Further Information

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