Press Release

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Trend Report No. 3: Energy Efficiency and the Increasing Standard of Living

Reconciling Energy Efficiency and the Increasing Standard of Living – New Opportunities for the German Process Industry in Asia

- **German technology lead makes up for China's innovation campaign**
- **Efficient use of resources opens up possibilities for newcomers**

China has moved up the ladder, now ranking as the world's fourth largest economy today and surpassing nations such as France and Great Britain. China has become Germany's most important trading partner in Asia. Many medium-size companies are aware of the prospects and are venturing into China in increasing numbers. In this time of booming growth, the 7th AchemAsia, to be held in Beijing from May 14 to 18, 2007, represents an optimal forum for a wide range of industries providing equipment, technologies and know-how to Chinese chemical, petrochemical, pharmaceutical, food, biotechnology, and environmental technology companies and related sectors of the process industry. 500 exhibitors from 25 countries and 20,000 visitors are expected at the AchemAsia 2007.

Fast economic growth, paired with complex social changes, has led to a tremendous increase in energy consumption in Asia, especially China. The gap between the rapidly rising energy needs and the country's own energy reserves is getting bigger. Since securing the energy supply of the future is a prerequisite for continuous economic growth and forms the basis of social-economic and political stability.

China wants to reduce its current energy consumption in the next five years by 20 percent. For China to achieve this goal, more energy-efficient technologies and materials will be needed. The increasing standard of living, especially in China's urban areas, is also boosting the need for high-quality chemical products. For suppliers with a large and innovative product portfolio, this opens new, interesting business and investment possibilities in the highly competitive Chinese market.

China – the world's largest market for the chemical industry

The rapidly increasing consumption of chemical products in China has triggered a worldwide change in the chemical industry. The growth rate of chemical consumption in the past decade shows where the lucrative markets have moved. While Chinese consumption grew annually by roughly 12 percent, the growth rate was 4 percent in the EU -25 zone (comprising all EU member countries) and the United States and merely 2 percent in Germany[a]. The German Chemical Industry Association VCI estimates that chemical consumption in China will grow at an annual rate of 7 percent until the year 2010, as opposed to a growth rate of only 2.5 percent in Europe.

In terms of sales, China is already the second largest market for chemical products, and by 2015 is will be the world's number one market[b]. Chinese demand for plastics, for instance, will make up one quarter of the global demand. However, the Asian competitors develop at the same speed as the demand. Lower labor costs, less stringent environmental standards, and geographic proximity to the raw material markets allow them to offer products at lower prices.

The Chinese state-run company Sinopec, which was almost unknown to the industry outside China until the 1990s, grew within just six years into the 7th largest chemical corporation in the world with an annual turnover of USD 21 billion. Together with PetroChina and CNOOC, Sinopec forms the troika of the most important state-run industry conglomerates in China[c]. It is specializing in the production of basic chemicals such as ethylene, propylene, ammonia, benzene, and chlorine. But the Chinese government now also views the specialty industry as an important sector and wants to give it a bigger piece of the cake, increasing its share from currently 30 percent to 45 percent of the total chemical production in China in the next few years. With ChemChina, another chemical giant has been added to the group of industry giants, and the Shanghai Chemical Industry Park (SCIP) was established especially for chemical specialties.

The German chemical industry is going strong in China

Despite its efforts to expand its own production capacities, China is not able to satisfy the tremendous demand for chemical products all by itself and will depend on imports for quite some time. However, international corporations, which are following their customers to China, are building an increasing number of domestic production facilities. These facilities are not limited to simple production processes any more but also handle processes that generate a high level of added value, and even research and development facilities are being installed. German companies with top technologies such as BASF and Bayer are among the largest foreign investors in China.

Until the end of 2010, BASF aims to generate 50 percent of its Asian business and one-tenth of its total sales in China, with two-thirds of the production being done locally[d]. The company, headquartered in Ludwigshafen, Germany, is planning to invest roughly one billion Euros in Asia in the next few years, the bulk of it likely in China. The core piece of the company's China strategy is a 2.4-billion-euro chemical plant in Nanjing, which BASF built in cooperation with the Chinese Sinopec Group.

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[a] Chemieindustrie in China: International auf der Überholspur. Deutsche Bank Research, September 5, 2005.
[b] Branche kompakt – Chemie-, chemische Industrie – VR China. bfai-Datenbank, 2006.
[c] Die deutschen Chemieunternehmen auf dem Weg nach China. Price Waterhouse Coopers, May 2005.
[d] *Chemieindustrie drängt nach China*. Handelsblatt, September 28, 2005.

Similar to BASF, Bayer also benefits from the booming Chinese economy. The company recently started up its 1.4-billion-Euro facility in Shanghai, where polycarbonates, polyurethane raw materials for foams, and coating raw materials will be produced. In 2005, 17 percent of Bayer's total sales of 27.4 billion Euros were generated in the Asia-Pacific region, which includes China. The long-term goal is to increase the region's share to 10 percent of the total sales.

In addition to other industry leaders, such as Degussa and Lanxess, German medium-size companies are also intensifying their commitment in China[e]. 26 percent of the German medium-size companies, according to a study by the professional services firm Ernst &Young, view the Chinese market growth as an opportunity. Currently about 17 percent of the German medium-size companies do direct business with Chinese partners, and 12 percent would like to enter the Chinese market or expand their already ongoing activities in China.

Not only quantity, but quality, also!

Chemical production in China today is not only about sales volumes any more. Quality, which for a long time was rather a criterion for export goods, is gaining in importance also for domestic products. Especially the quality expectations of the Chinese middle class are rising and will soon be no different than the ones of consumers in western industrialized countries. For producers of specialty chemicals, this is an opportunity to open up new markets. According to the Internet newsletter China Chemical Industry News (CCNN) there is a growing demand for plastic additives such as plasticizers, thermal and light stabilizers, flame retardants, antioxidants, colorants, antistatic agents, and lubricants. The annual growth rate of these products is roughly 9 percent, compared to the global growth rate of 4 percent. In view of these growth rates, only those companies will be globally successful which also have a leading position on the Chinese market for specialty chemicals.

Competing for market share is often difficult, as Chinese manufacturers in particular tend to outdo foreign competitors by severe price-cutting. In an exclusive study for the German business weekly Wirtschaftswoche, the consulting firm A.T. Kearney describes strategies against the growing competition from Asia. According to the study, product portfolio management and cost reduction are not going to be enough. Companies will also have to generate a sufficient number of innovations that fit customers and the market. Much more than before, innovations will be oriented towards the time requirements, processes and structures of potential customers. Suppliers have to adjust their business processes and structures as well as their decision guidelines in order to be competitive[f].

German technology lead makes up for China's innovation campaign

There are numerous examples where manufacturers of specialty chemicals have successfully tailored their innovations to their customers and the market. For instance, Lanxess responded to the increasing demand of the automotive industry for on-line coatable thermoplastics by developing a new material that weighs only half as much as conventional steel. It is used in the fenders of the new BMW 3 Series Coupé, which are made of the thermoplastic polymer Triax. The material not only weighs less, it also exhibits high stiffness and heat resistance, reduced water absorption and low thermal expansion.

The plasticizer Hexamoll developed by BASF illustrates that products can be made to fit the end customers' needs despite the added value chains being often very complex. The additive, which makes plastics softer and more elastic for processing or end use, poses no

[e] *Deutscher Mittelstand auf Expansionskurs in China*. Beijing Rundschau 42/2006.
[f] *Wohin treibt die Spezialitätenchemie?* WirtschaftsWoche, October 28, 2006.

human health risk. This property is crucial especially for plastics that are used in sensitive areas such as toys, medical products, and food packaging.

The additive Firesorb from Degussa is also receiving quite some attention. When added to water, it acts like a blanket, smothering the fire by sealing out the air and creating a cooling effect.

Enhanced safety is also the promise of a new plastic material from Bayer. Data can be stored holographically on a plastic card, providing extremely high protection against unauthorized access to the stored data so they cannot be tampered with or copied.

With these and numerous other innovative applications, German chemical companies have demonstrated their technological head start. However, this position must be secured by continuously feeding the market new products and developments in order to compete successfully against Asian rivals.

Innovation becomes even more important in view of a series of measures that the Chinese government hat taken to turn China into an innovation-oriented nation until the year 2020. According to the 11th five-year plan, the expenses for science and technology between 2006 and 2011 will increase at a higher percentage rate than the government revenue[g]. For the Chinese economy, which currently carry 60 percent of China's research and development expenses, the government has created incentives to foster innovation. For instance, high-technology firm are exempt from corporate taxes for the first two years and pay only 17 percent corporate text thereafter, while their purchases of equipment and raw materials are not subject to value-added tax at any time.

Efficient use of resources opens up possibilities for newcomers

Despite this powerful initiative for innovation, China will continue to depend on the know-how of foreign companies. This applies especially to the energy sector. During the decades of fast-paced industrialization, inefficient technologies using immense amounts of raw materials, energy and resources and lacking wastewater or air purification. Meanwhile, the rise in the standard of living of millions of people has led to an increased demand for resources. China only started to address the most serious environmental problems about ten years ago. Due to the ongoing intense industrialization and rapidly increasing motorization, the upward spiral of environmental pollution could not be brought to a halt, or reversed.

But the limited availability and higher prices of resources have also had their impact on the way China looks at environmentally compatible construction as a way of building today and in the future. For the sake of China's future, it is indispensable for the country to make a shift towards renewable energies and a sustainable way of handling the resources that form the foundation for human life. In the year 2020, the Chinese population will have grown by 150 million to 1.4 billion inhabitants. In one of the greatest migration movements in the history of mankind, 300 to 500 million people will be moving from the countryside to the cities in pursuit of work – the same amount of people currently living in all 25 countries of the EU. According to the latest government statistics, 500 million Chinese live in cities today. In fifteen years, this number will reach one billion.

This development goes hand in hand with a boom in urban construction, which benefits especially the manufacturers of plastic components, such as window frames, insulation materials, and pipes, as well as paints and coatings manufacturers. In this sector, a slowly changing trend is discernible towards ecologically harmless and energy-efficient products, including ecologically compatible wall paints, insulation materials, and double-pane insulated windows. The Chinese government plans to encourage this trend through tax incentives and subsidized credits.

[g] China auf dem Weg zur Forschungs-Großmacht. WirtschaftsWoche, October 17, 2006.

The Beijing office of GTZ, the German-based international cooperation enterprise for sustainable development, sees excellent market opportunities for German companies in components for the exterior renovation of buildings, as well as in heating systems. Within the „Ecobuild Shanghai 2006“, a cooperation project between the cities of Hamburg and Shanghai to raise awareness for ecological building concepts, the Delegation of the German Industry and Commerce in Shanghai has created a platform for German companies. In November 2006, an exhibition featuring eight building projects in Shanghai showcased energy-efficient construction. While German companies offer the latest innovations worldwide in energy efficiency, their marketing needs major improvement if they want to remain competitive, in particular in comparison with US firms.

There are numerous pioneering projects in China today where ecological technologies and concepts are in demand. A prominent example is Dongtan, the world's first „eco-city“ on the island of Chongming, 40 kilometers off the coast of Shanghai. Starting in the year 2010, the new city will offer living space for 20,000 people in a „carbon-dioxide-neutral“ environment. The city is eventually planned to be one-third the size of Manhattan in terms of population.

A strong economic power is emerging on the subcontinent

According to a recent study by the Central Bank of Germany, India will offer similar market and production opportunities as China[h]. For a long time, foreign investors were reluctant to venture into India because of its weak infrastructure, strong federalism, outsized bureaucracy and the dominant role of regional, ethic, and religious elements in politics. Since the early 1990s, however, deregulation, privatization, and the opening of the country to foreign trade have led to strong economic growth and, subsequently, to tangible results in India's fight against poverty. Current market studies by the Deutsche Bank, Goldmann Sachs, and UBS unisono predict that India will develop into the world's second-largest economy in less than two decades. In addition to the service sector, tremendous growth is also expected in other industries. The Federation of German Industries BDI expects a two-digit growth rate percentage for chemical products[i].

As an economic hub, India has an advantage over China namely due to its lower labor costs, highly qualified English-speaking professionals, a domestic market of 1.1 billion people with the trend to expand even further, and better legal security, especially in terms of intellectual property protection.

India is not the only country with a growing domestic market that is based on improved political stability. The same applies to Malaysia, Indonesia, and Vietnam[j]. For companies from established industrial nations, new markets open up if they keep the focus on their specific strengths.

[h] *Länderstudie Indien*. DZ Bank, May 18, 2005.
[i] *Indien auf dem Weg zur Wirtschaftsmacht*. Bundesverband der Deutschen Industrie e.V., April 2006.
[j] *Asien ist mehr als nur China!* Deutsche Bank Research, April 14, 2005.

Conclusion

In the next few years, the German Chemical Industry Association VCI expects the average annual growth rate of chemical products to be significantly higher in Asia than in Europe. In view of this dynamically growing chemical market, the German chemical industry will have to continue its commitment in the region – for two reasons: first, important buyer industries have moved their production to Asia; and, secondly, the demand for chemical products will continue at a high level.

A crucial element of the business strategy of German chemical companies must be the development of innovative products and processes that integrate environmental technology and biotechnology. This will not only help companies opening up new markets but also maintain their position as manufacturers of high-quality products, as opposed to low-cost products from Asian competitors. Here more investments in research and development are required, because due to the country's broad innovation initiative, Chinese competitors are in the process of catching up. This development should not be underestimated.

Productivity, flexibility, quality, a permanent head start in know-how, and a quick time-to-market of innovations are the complex elements of the Asian chemical market. Only the companies that implement these factors in their business are the ones that will be able to take advantage of the outstanding opportunities this market has to offer.

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