



# Is This the Chemical Promised Land?

## An Overview of the Chemical Industry in China

by DR. KAI PFLUG

The chemical industry comprises the producers of industrial chemicals. These companies convert raw materials such as oil, natural gas, air, water and minerals into more than 70,000 different products. For historical reasons, some materials that are produced via chemical processes (e.g. steel) are not considered to be part of the chemical industry. Some industries, such as the pharmaceutical industry, have considerable overlap with the chemical industry, but will be regarded as separate for the purpose of this article. The chemical industry is one of the largest industries in China, with annual sales of about USD 1tn. Globally, this makes China the biggest producer of chemicals, currently accounting for slightly below 30% of global chemicals production and predicted to rise to one third within the next few years. With an annual sales growth of 10% for the domestic chemical industry (according to CPCIF, an industry association), China is also the main growth driver for the global chemical industry, accounting for 35% to 40% of global demand growth. Some slowdown – roughly in line with the decline in Chinese GDP growth – is likely in the future. However, globally the Chinese chemical industry will further increase in importance.

### Key Characteristics of the Chinese Chemical Industry

Some of the characteristics of the global chemical industry are its multi-step processes, a focus on research and development (R&D), the importance of B2B transactions (most chemicals are utilised by other chemical companies as input for their processes or products) and the large number of applications for many chemical products. All these characteristics generally apply

to the Chinese chemical industry as well. However, there are several aspects wherein the situation in China differs from that in more mature chemical markets.

One unique characteristic of the Chinese chemical industry is that it is highly fragmented. According to an SRI estimate, there are about 40,000 manufacturers of chemicals in China. Even in individual segments of the industry, the number of companies is still very high – for example, there are about 10,000 coatings producers and almost 1,000 pesticide producers.

This broad field of companies is composed of three distinct types of players. Most multinational companies also produce in China by now, but still rely on imports for some of their more sophisticated products. Local private companies are often very small and mostly target the low end of the market, though there are exceptions. State-owned chemical and petrochemical companies such as Sinopec, Petrochina, ChemChina and Sinochem are huge in size and so far focus mostly on basic chemicals. These companies are under strong political influence rather than being purely driven by profits. Apart from the obvious influence the government exerts via the state-owned chemical companies, there is also a stronger political influence on the industry as a whole in China than in other countries. For example, there are catalogues of chemicals grouping them into encouraged, tolerated and prohibited types. The government directly addresses issues such as the overcapacity for polysilicone via specific restrictions. In addition, the chemical industry is also affected by larger political objectives such as the industrialisation of China's Western provinces.

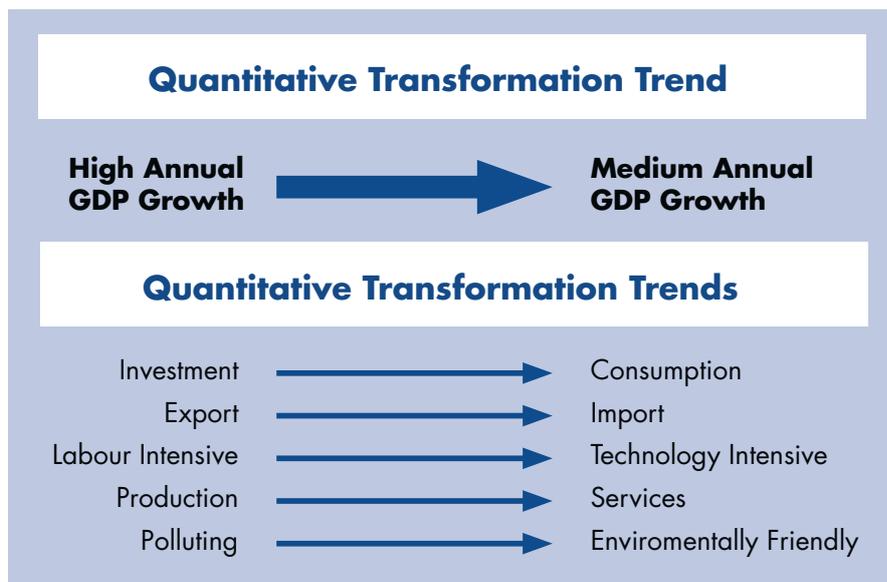
Though hard to quantify due to the inconsistent definition of the term, in China basic chemicals still account for about 10-15% more of the total sales volume than in Western markets. The Chinese chemical industry is also unusually dependant on imports. Despite massive capacity build-up, e.g. for commodity polymers such as PP and PE, a substantial share (20-40%) of these materials is imported. Imports are likely to continue for years to come, particularly as Middle Eastern oil producers aim to extend their involvement to more stages of the petrochemical value chain. This is despite declared government goals to increase the self-sufficiency for chemical products. In many specialty chemicals areas, high-end products are still being imported rather than produced locally. The product variety produced by local companies is limited compared to that of multinationals. All this points to a lack of research, particularly the type of research directed at customer requirements and application-specific products rather than at process improvement.

One of the most striking trends in China is the continued build-up of capacity even for products with low capacity utilisation. PVC is a good example of this phenomenon. In 2011, there were more than 30 domestic projects leading to a growth of PVC capacity (either set-up of new lines or expansion of existing lines). Given that domestic consumption increased by double-digit figures and that China imported substantial amounts of PVC, this expansion at first glance seems to make some sense. However, the capacity utilisation in 2011 was only 51%, which indicates that the prospects of the new capacity coming on stream are limited. In addition, China's anti-dumping tariffs on PVC from selected countries show that the domestic industry may simply not be sufficiently competitive.

### Major Chemical Industry Trends During the Transformation of Chinese Economy

One of the major buzzwords in discussing developments in the Chinese economy has been "transformation". This term summarises a number of trends with the overall goal of increasing the sustainability of China's economy.

What do the individual qualitative trends mean for the different segments of the chemical industry in China? The shift from investment to consumption will benefit those chemical segments supplying consumer products, for example consumer



care chemicals. In contrast, chemical segments such as construction chemicals – which naturally depend on investment in infrastructure and buildings – may suffer. Reduced exports are likely to negatively affect segments with export-oriented end customers such as textile chemicals, textile dyes and leather chemicals. Chemical MNCs with a strong China presence may benefit by increasing their imports of high-end specialty chemicals and materials. However, it is likely that China will remain a strong exporter of chemicals, particularly for those (e.g. citric acid) where it dominates the global market.

The transformation towards technology and innovation is already quite visible in the many R&D centers that have been established in the past ten years. This trend is likely to continue, with smaller and second-tier foreign companies as well as bigger domestic companies also increasing their R&D work in China. China's domestic companies are striving for upgrades. For example, in titanium dioxide this means that local Chinese producers shift from the low-end anatase to the higher-end rutile varieties. As often in China, this shift is promoted by the government. At the same time, China is also looking at technologies not fully established elsewhere, and trying to gain technology leadership. The most prominent example of this is the rise in coal chemical projects. The shift from production of physical products to services is one that will have a marginally negative effect on most chemical segments, as the chemical industry by definition focuses on physical products. Finally, growing awareness of environmental issues will benefit a few chemical segments (such as

water treatment chemicals) while at the same time negatively affecting others (such as leather chemicals, pigments and dyes), similarly to the segment shift experienced in Europe and the US a few decades ago. In general, environmental protection is becoming increasingly important in the production of chemicals, particularly as the government has to cope with protests from the emerging middle class. This trend is particularly strong in the more developed regions in eastern China, where essentially all chemical production has been shifted to dedicated chemical parks.

### Other Key Trends

Investment in western areas is rising faster than in east China, as production capacity is shifted to new production sites in western and central China. While the weaker environmental regulations in these poorer areas are one reason, another is the government promotion of more evenly spread nationwide development. Currently, Chongqing in central China is a focal point of investment, with BASF followed by other multinationals in setting up production. Typical multinational chemical companies currently obtain about 10% of sales in China, though for some companies such as Dow Corning and LG Chemical, the figure is already much higher. This figure will increase and push multinationals to localise more and more of their operations in China. At the same time, domestic chemical companies are continuing to invest in additional production capacity, partly but not exclusively in newer areas such as coal chemicals. This will also lead to the closure of smaller plants and the increase of average plant size.

Another clear trend has been for major petrochemical companies to secure raw materials supply abroad. Pushed by the Chinese government, Sinopec, CNOOC and PetroChina all will continue to acquire gas and oil resources outside of China. A related move is to invest in coal-to-chemicals processes as domestic chemical companies see coal as a more reliably available source than crude oil. However, it is unlikely that the current boom in these projects will continue as China's coal reserves are not unlimited.

So far, domestic companies have done limited long-term strategy development, in particular development based on a company's specific strengths rather than on market opportunities. This has been a contributing factor in many of the challenges the Chinese chemical industry faces, such as the tendency toward overcapacities caused by strategic crowding. Domestic companies have now started to look more intensively at their internal value chains, striving for value chain integration and creation of "Verbund"-type structures. Among domestic companies, there is also a trend to cooperate or even to consolidate operations. This is partly due to the still very fragmented nature of many markets (there are for instance more than 100 domestic PVC producers). However, it is also more and more often active government policy which promotes consolidation. One of the tools is to create minimum capacity regulations for the production of many chemicals, another is to tighten environmental regulation.

Perhaps the most important trend in the Chinese chemicals market refers less to the type and more the quality of chemical products. Indeed the quality of many basic chemicals such as MDI has now achieved global standards, while in other areas such as specialty and high-end chemicals there is still room for improvement. The competition between domestic and multinational chemical companies will largely take place in the growing mid-level segment of the chemicals market. This market is targeted by domestic companies from below – which mainly requires to improve the quality of their products – as well as from the top by multinationals – which requires the adaptation of global products to domestic cost structures. The underlying reason for the shift towards higher quality is the often-quoted growth of the Chinese middle class.

### Participation of Western Players: Is the Playing Field Level?

Obviously, given the importance of the Chinese chemical industry, multinational

companies are highly interested in participating in its future growth. However, executives of western chemical companies active in China sometimes question whether the playing field for western and domestic companies really is level or tilted in favour of local players. Examples given for such preferential treatment include both formal, written regulation and unwritten rules and practices.

Some of the regulations applicable to the chemical industry distinguish between foreign and domestic companies. For example, in an implementation measure of the 12<sup>th</sup> Five-Year Plan, the 2011 Foreign Enterprise Investment Catalogue, foreign-owned and domestic companies are treated differently. It is one of the suggestions of the Chemicals Working Group of the European Chamber of Commerce to change these to equal investment rules. In addition, the Chinese government provides substantial R&D funding for domestic chemical companies, but not all of these are also accessible for foreign companies. Also, for toxic chemicals, MNCs exporting toxic chemicals must register these at costs of USD 10,000 per certificate, while domestic producers do not have to do this. State-owned entities (SOEs) get preferential treatment over both foreign companies and domestic privately-owned companies in a number of ways. Some of these are direct subsidies paid by the state and local governments, e.g. for refining losses. Others work indirectly via state-owned banks which provide preferential financing to SOEs at the expense of other companies.

However, most of the perceived preferential treatment of domestic companies is in more grey areas, taking the shape of unwritten rules and practices and thus both more difficult to prove and more easy to defend despite China being a member of the World Trade Organisation. One example of this is that, for state-run projects, multinational companies are generally not selected as suppliers. "Indigenous innovation" considerations favour government procurement of products with Chinese IP. For the oil import and wholesale market the award of import licenses is not transparent. In addition, existing environmental laws, e.g. regarding environmental protection and transportation safety, are often applied inconsistently and to the disadvantage of MNCs. While both MNCs and local companies are subject to the same regulation, almost all managers of western chemical companies feel that the enforcement is much stricter for foreign companies. According to the

Chemicals Working Group of the European Chamber of Commerce, the evaluation criteria applicable to chemical projects are often not clearly communicated or are changed on short notice, and the selection of experts for the reviews is not transparent. There are examples of local direct competitors of a foreign applicant being requested to join the advisory panel, thus giving the competitor direct access to proprietary information.

Altogether, these different practices certainly represent a disadvantage for foreign chemical companies doing business in China. "China is in principle on a good way in terms of regulatory issues. On the other hand, readily available international standards and best practices are often not adopted, which leads to distortions in the competitive landscape of the chemical industry in China and generally favours domestic companies," says Martin Kraemer, Chairman of the working group. However, China is by far not the only country favouring local companies despite paying lip service to free markets and free trade agreements. It is hard to imagine, for example, the police force of a German city buying Chinese or Japanese cars for fear of political fall-out. "Buy American" campaigns such as the one started a few months ago by Wal-Mart also cater to similar sentiments. In addition, while SOEs certainly benefit from government support, the government expects the SOEs to also support government goals such as preventing unemployment, even if these goals have been a reason for the extremely low profitability of the SOEs in the past. In total, it is therefore far from certain that SOEs really gain a competitive advantage from their close connections to the Chinese government.

Overall, the Chinese chemical industry is bound to grow and impossible to ignore for any serious global player. At the same time, the industry by and large is changing in ways that will make it more similar to the chemical industry in western countries. In the long run, the uniqueness of China's chemical markets will therefore derive more from its massive size than from its unique qualities.

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