



# Challenges and Opportunities for Commodity Chemicals in China

By Dr. Kai Pflug, Management Consulting - Chemicals

Looking at the situation of commodity chemicals in China today, even a superficial analysis will uncover many challenges, which will briefly be described below. However, it should not be ignored that commodity chemicals still offer opportunities in selected areas, and this paper will highlight some of them.

Start with the bad. Even more than specialty chemicals, commodity chemicals in China suffer from a slowdown in GDP growth, particularly in the areas of infrastructure and construction. As a consequence of this slowdown and the earlier capacity buildup, utilization rates are now quite low for many commodity chemicals. For example, BASF recently stated that Asian capacity utilization rates in acrylic acid and toluene diisocyanate average 60%, those of butanediol are at 65%, and caprolactam and methylene dipara-phenylene isocyanate (MDI) are each at 70%. And these rates are already higher than for even more commoditized products such as methanol, for which domestic capacity utilization is not much above 50%. The current overcapacity is a consequence of the massive capital investment in the Chinese chemical industry. According to CEFIC, this reached Euro 95.6 billion in 2015 – a much higher investment than in the EU (Euro 20.7 billion) or the US (Euro 32.5 billion) in the same year. Other challenges to commodity producers come from stricter (and more strictly enforced) environmental regulation and the pressure to shift chemical production

to chemical parks, both of which may increase the production cost of commodity chemicals in China.

These aspects are also strongly reflected in the parts of the 13th Five-Year Plan (2016-2020) which relate to chemicals. For commodity chemicals, tackling of overcapacity is the main goal. In particular, the Plan describes the reduction of overcapacity via elimination of plants exceeding energy or emission standards (with the added bonus of environmental improvements), phasing out of capacity with below-average profitability (which would also improve the economic situation of chemical companies), and the upgrading of portfolio towards higher-end and differentiated products, partly as replacement of imports.

However, there are also several commodity chemicals for which the Chinese market – served either via imports or via local production – still looks quite promising. Let us look at some of the most prominent

examples, each with their own advantages, but also specific risks.

## PX

According to ICIS, China currently uses about 53% of the global PX production. The consultancy forecasts that PX imports to China will remain more or less stable at 17 million tons in 2026 (from 18 million tons in 2016) while domestic production will also increase substantially. As a consequence, PX offers long-term opportunities both for domestic producers and for foreign producers aiming to serve the Chinese market via imports.

Construction of domestic PX capacity is encouraged by the MIIT, and several players are setting up new capacity. These players include PTA producers moving upstream, refineries expanding downstream and even companies betting on methanol-to-aromatics processes. However, setting

Chemical Product	Reasons for Potential Attractiveness	Obstacles (examples only)
PX	<ul style="list-style-type: none"> <li>PX Imports are forecast to reach 17 million tons in 2026 (from 18 million tons in 2016)</li> <li>China uses about 53% of global PX production</li> </ul>	<ul style="list-style-type: none"> <li>PX plants in China face political obstacles</li> <li>Complex raw materials situation depending on oil price</li> </ul>
PP	<ul style="list-style-type: none"> <li>China is forecast to still to be a strong net importer of PP in 2026 (4 million t imports per year)</li> <li>China does not produce all grades required domestically</li> </ul>	<ul style="list-style-type: none"> <li>Complex raw materials situation depending on oil price</li> <li>Foreign competition from locations with low raw materials prices (Middle East)</li> </ul>
MMA	<ul style="list-style-type: none"> <li>China has only about 70% of the capacity required for self sufficiency</li> </ul>	<ul style="list-style-type: none"> <li>In 2014, Chinese capacity utilization of MMA was only about 43%, indicating low competitiveness</li> <li>For imports: antidumping tariffs</li> <li>Increasing self sufficiency rate</li> <li>Limited growth</li> </ul>
PC	<ul style="list-style-type: none"> <li>Imports are growing, and import dependence is above 70%</li> <li>Growth forecast is 5% per year</li> <li>So far only JVs producing PC</li> </ul>	<ul style="list-style-type: none"> <li>Local entrants building up capacity, e.g., Wanhua</li> <li>Import dependency will be reduced in the future</li> <li>Entry barriers (investment requirements, technological knowledge)</li> </ul>

Fig. 1: Some opportunities in China's commodity chemicals with rationale and obstacles



up PX plants in China has faced substantial obstacles in the past. Despite its relatively low toxicity, PX has emerged as a symbol of the negative sides of the chemical industry among the Chinese population, and several local protests against PX plants have led to the cancellation of such projects. On the other hand, key exporting countries of PX to China – in particular Korea and Japan – may in the longer run suffer from cost positions that are higher than for newly-built, world-scale plants in the Middle East. So there is a case to be made that in the long run PX plants will only be competitive either directly at the source of the raw materials (i.e., the Middle East) or at the location of downstream utilization (i.e., in China).

## PP

Though China's PP capacity has been increasing strongly over the past few years, it is still well below China's demand despite a high domestic capacity utilization of about 95%. In fact, ICIS predicts that China will still be a strong net importer of PP in 2026, with an import amount of 4 million tons per year. And though China has been increasing its domestically produced share of specialty grades from about 30% to 40%, it still relies on imports for many such grades. Partly this may be due to the fact that the domestic leaders are Sinopec and PetroChina, state-owned enterprises which tend to focus on volume rather than on variety.

Current PP imports are still substantial despite a 16% drop in the period of January to July 2016 compared to the same period in 2015. While the biggest PP application in China, construction, is declining, other major applications such as injection molding are still growing, leading to the forecast of long-term import needs. For potential new entrants into PP production in China, the key question is which raw material to use as a basis. Propylene can be obtained from coal (CTO), from methanol (MTO), by dehydrogenation of propane (PDH),

as byproduct from a refinery or via steam cracking (among others). The relative cost position of these options depends primarily on the oil price, with the current low price situation favoring naphtha as a source followed by PDH, while the coal chemical routes (CTO and MTO) are less competitive. However, capital investment is another issue, which may make potential investors favor PDH or MTO, the first in particular if a producer also has an outlet to maximize profits from the PDH byproduct hydrogen.

## MMA

For MMA, China has only about 70% of the capacity required for self-sufficiency, and imports account for a large share of local consumption (more than 45% of the consumption in 2014). Curiously, though, this situation coexists with a low utilization of capacity within China – in 2014, this reached only 43%. This indicates that China's existing producers may have difficulties competing with imports, and indeed China has enacted antidumping tariffs of 6.8% to 34.6% on MMA from Singapore, Thailand and Japan. Of course, these barriers may also affect exports of future entrants to China. Given that MMA has strong competition from other materials, that domestic consumption is only forecast to increase by an annual 3%-4% and that domestic capacity has recently risen considerably, only a dedicated player with specific competitive advantages in MMA should further consider this market. China's antidumping measures also point at an advantage of investing in local capacity rather than in relying on imports, as long as competitive production costs can be achieved.

## PC

China's polycarbonate demand is growing by an annual 5% to 2020 according to IHS. China is also by far the largest global market for the material, accounting for more than 35% of global consumption. At the same

time, local production is quite limited and up to very recently was only done with the involvement of foreign companies in joint ventures. Accordingly, China imports more than 70% of its consumption.

While these aspects make an entry into domestic polycarbonate production look attractive, it needs to be pointed out that several domestic companies are already working on this, including strong players such as Wanhua, and existing players producing in China are also considering capacity expansions. In addition, for newcomers the polycarbonate business has high entry barriers due to the substantial investment need and the access to suitable production technology. Another uncertainty is the production process to be used. Several of the newer plants intend to utilize non-phosgene routes, which may eventually be favored by Chinese regulatory authorities but for which also less operational knowledge exists, and which consume more energy.

These four chemical commodities are examples for existing opportunities in the Chinese commodity chemicals segment – they still exist despite the economic slowdown and the overcapacity for many chemicals. Generally speaking, the examples given combine relatively high investment needs with other entry barriers such as technological expertise for at least part of the market. As a consequence, China will still rely on imports for these materials, making an investment (either domestically or abroad for later import) a potentially attractive option. Of course, as the market situation for the materials listed is generally known, many companies will consider investment in these areas. Therefore, only those companies which have a competitive advantage for one or more of these materials should go ahead with an investment. Ignoring this rather basic advice has led to many loss-making chemical investments in the past, particularly in China. ■