



Challenges and Strategies for Chemical Parks in China

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China's approximately 600 chemical parks are currently in a situation that at first glance seems quite enviable. As the government has mandated the relocation of chemical production into chemical parks and imposed tight deadlines, attractive chemical parks get a large number of enquiries from potential tenants. As a consequence, they can afford to be selective. On average, many accept only 30–40% of all applications, and this figure can go down to as low as 10% in specific locations. Some provinces have set up high entry barriers for allocating space in chemical parks, e.g., Shandong province asks for a minimum investment of RMB300 million for production of hazardous chemicals.

However, the situation may not always remain as positive. The government has already announced that it intends to stabilize or even reduce the number of chemical parks to around 500. Shandong province has specifically stated

the objective to reduce the number of chemical parks in the province from 200 to around 100, and has already started a stringent qualification process. Furthermore, the tightening of environmental and safety regulation – which has been given another push by the Xiangshui explosion in March 2019 – will put pressure on chemical parks to improve their safety standards and reduce their emissions. Therefore, unsuccessful and substandard chemical parks face the risk of being closed down within the next few years. An admittedly imperfect back-of-the-envelope calculation comparing Germany with China shows that China would need about 300 chemical parks compared to Germany's 37, so despite the current huge demand for space in chemical parks, the current number may already be somewhat large.

In addition, the government has outlined clear objectives for chemical parks in the relevant parts of the detailed 13th Five-Year Plan. Key

targets include standardization of chemical parks, the consolidation of the parks, better park management, higher safety standards and improved environmental protection. In principle, the government does not permit the establishment of new chemical parks. On the other hand, existing and well-run chemical parks will benefit from the government policies of only allowing new chemical enterprises inside chemical parks, and of accelerating the relocation of chemical production to chemical parks.

What does this imply for the existing chemical parks? On the one hand side, they will have to go along with these government policies, in particular the required improved environmental standards. On the other hand, they will also have to take the perspective of their customers – the companies establishing production at their parks – into account. Key areas of concern for customers include the



provision of services on site; the reduction of costs for these services; and fair, transparent cost allocation.

But of course – as the complete closure of the Xiangshui chemical park demonstrates – the chemical companies at a chemical park also have a vital interest in the park and their fellow tenants complying with environmental regulation. In fact, in the future companies may by their own initiative ask chemical parks to take a more active role in enacting and controlling environmental and safety regulation, as they want to ensure not to suffer from the negligence of other tenants. Chemical parks can actively work in this direction by, e.g.,

- Establishing real-time monitoring of emissions at multiple locations (particularly at those locations where emissions can still be attributed to individual companies)
- Carrying out own inspections within the park in order to spot issues at an early stage
- Partnering with companies specifically focusing on HSE
- Providing trainings etc. to individual tenants

• Giving incentives to tenants to reduce emissions and improve environmental performance

To take a step back, chemical companies generally have three main reasons for preferring chemical production inside a chemical park, rather than outside. First of all, and currently by far the most important reason, is the legal requirement to locate chemical production inside chemical parks. However, chemical parks are also attractive production locations in countries like Germany, demonstrating that there are other advantages of such parks.

Chemical parks allow their tenants to focus on their core business, which tends to be the R&D, production and marketing of chemicals. They do that by offering a broad range of services that are vital, but less specific to the individual company, such as the provision of energy, fire services, logistics, staff canteens and many others (see Fig. 1 for details).

The second, related aspect is that by offering these services to multiple companies within a chemical park, chemical parks help reduce operating costs. As site costs typically account

for 10-15% of total cost of chemical production, any savings achieved are highly relevant for profitability. And if a chemical park hosts 50 or 100 different chemical companies, it is obvious that there are gains from economies of scale in providing, e.g., energy, waste management or fire service.

Despite these savings, chemical parks should also focus on controlling costs of their offerings, as chemical companies will – particularly in a more mature stage of the industry – have a broader choice of parks and will select those offering the best conditions. An important aspect of this is the allocation costs. It should be transparent to the park tenants and broadly be accepted by them. This may not always be straightforward – for example, one could make an argument for the allocation of fire service costs just being based on company sales, or one could consider the different risk level of chemicals produced and take this into account as well. Benchmarking of the cost of individual services compared to other chemical parks is another important tool to control costs.

Specialization will also contribute to cost reduction inside chemical parks. Obviously, it will be easier to achieve economies of scale at a given chemical park if specialization allows a focus on specific chemical areas. Examples of such types of specialization could be:

- By value chain: attract companies within the same chemical value chain in order to minimize transportation costs and time (“virtual Verbund”)
- By chemical segment: attract companies in a similar chemical segment and thus with



Fig. 1: Services offered by chemical parks in Germany (source: VCI)



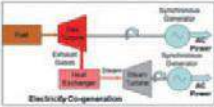



Area	Rationale		Company Example
Energy Generation	Economies of scale and technology know-how leading to lower cost		Veolia, Statkraft
Water Treatment	Economies of scale and technology know-how leading to lower cost		Chemtreat, Veolia
Logistics	Global reach of logistics provider; expertise in chemicals		Rhenus, Schenker
Certification	Better expertise, higher credibility of external partner		TUV, Bureau Veritas

Fig. 2: Third-party service providers for chemical parks (examples)

similar needs for services (e.g., focus on logistics services for bulk chemicals, focus on R&D services and analytics for fine chemicals)

- By customer industry: attract chemical companies supplying the same broad end customer segment, e.g., automotive (particularly relevant if customer industry is located nearby)

- By resource needs: attract companies sharing the need for a specific raw material that needs to be produced locally (e.g., phosgene) or that have high energy needs

It is important to point out that the services offered by a chemical park do not necessarily have to be offered by the park itself. In fact, it may be more effective to partner with third parties with experience in specific services, and charge them with providing these services within the park. Fig. 2 gives some examples of such services and service providers.

Chemical parks in China may be well advised to examine their counterparts in Germany, specific site service companies such as Currenta and Infraserv, some of which manage and operate multiple chemical parks. In Germany, there is limited investment in new

chemical plants, forcing the chemical parks to be much more active in marketing their sites both directly and indirectly. In 10 or 20 years, the situation in China may be much more like it is in Germany now.

Given the government interest in standardization of chemical parks, the German model of a site service company managing several chemical parks should also be highly relevant. This model allows not only standardization but also better utilization of experience and best practice collected anywhere, and may even offer the potential for further cost savings via economies of scale. It should also be beneficial with regard to compliance with environmental and safety regulation. In addition, large-size chemical companies would likely also welcome the opportunity to work with just one or a few site operators across a multitude of sites.

To summarize:

1. Due to government regulation, the vast majority of China's chemical production will be shifted to dedicated chemical parks. This offers substantial opportunities for existing parks

2. However, at the same time, the government

pushes for high standards of chemical parks and wants to avoid increasing the number of parks. As a consequence, only high-quality parks will survive in the long term

3. High-quality chemical parks need to focus on the government requirement for environmental protection, and on the economic requirements of their tenants

4. To fulfill these economic requirements, chemical parks need to utilize economies of scale, which can be further supported by specialization into specific chemical areas

5. Chemical parks will have to offer a broad range of services to their tenants so that these companies can focus on their core business, chemical production. Chemical parks may consider cooperating with third parties to optimize provision of individual services

6. In the long run, chemical parks will need to improve their marketing, with a focus on giving tenants a clear rationale for selecting their site

7. Dedicated service companies may be an approach to improve service quality and decrease costs, and could help spread standardization and best practice if allowed to run multiple chemical parks. ■