



China's Standing in the Global Chemical Industry

*Dr. Kai Pflug, Management Consulting – Chemicals (kai.pflug@mc-chemicals.com);
Daniel Philip Senger, CDI Global (daniel.philip.senger@cdiglobal.com)*

It should not be a big surprise that we emphasize the importance of the domestic chemical industry compared to the global one, given we (the authors of this paper) make a living at least partly related to the health of China's chemical industry. We assume that many China-focused managers and the business development functions of multinational chemical companies will similarly want to highlight this aspect. Therefore, this paper compiles key data that provides quantitative evidence of the importance of China's chemical industry for both global and local players. In addition, some relevant conclusions can be derived from the difference between different such parameters, as will be explained below. Let us start with the data points as Tab. 1 and Fig. 1 illustrate:

- 2% share of the top 100 chemical companies
- 14% share of global chemical exports
- 19% share of global GDP
- 29% share of global chemical R&D
- 30% share of chemical gross value added
- 36% share of global chemical sales
- 45% share of global chemical capital

Tab. 1: China share of parameters related to the chemical industry

Parameter	China share of global	Year	Data source
Share (number) of companies among the ICIS Top 100 Chemical Companies	2%	2018	ICIS
Share of global chemical exports	14%	2018	WTE
Share of global GDP	19%	2018	IMF
Chemical R&D spending	29%	2017	CEFIC, ACC, Oxford Economics
Chemical gross value added	30%	2017	CEFIC, ACC, Oxford Economics
Chemical sales	36%	2018	CEFIC
Chemical capital expenditure 2018	45%	2018	CEFIC
Jobs in the chemical industry (direct, indirect and induced)	50%	2017	Oxford Economics
Jobs in the chemical industry (direct)	60%	2017	CEFIC, ACC, Oxford Economics



expenditure

- 50% share of global chemical-industry related jobs

- 60% share of global jobs directly in the chemical industry

What does this data mean? Let us look at the details and compare some of the parameters shown above.

1. The chemical industry is highly important for China. It not only provides a large number of jobs (8.7 million directly, 60 million including those indirectly supported by the chemical industry), accounting for half of the global jobs in

chemicals. With 36%, China also accounts for the largest global share of chemical sales – more than North America and Europe combined. Comparison of China's share of global chemical sales with its share of global GDP shows that the chemical industry is disproportionately important in China, as the former is almost twice as high as the latter (36% versus 19%).

2. China is still somewhat focused on the lower end of the chemical industry. Its share of global chemical gross value added (30%) is lower than its share of the chemical market (36%). This is something the government

is well aware and tries to actively change through direct and indirect policies, as witnessed by the focus on specialty chemicals in the 13th (and presumably also the 14th) Five-Year Plan.

3. China's chemical industry still has a lower productivity than the global average.

This is indicated not only by China's high share of jobs in the chemical industry, but also by direct productivity estimates. For example, Oxford Economics estimates that the productivity (as measured by gross value added) of chemical employees in APAC is only about 67% of that of global average

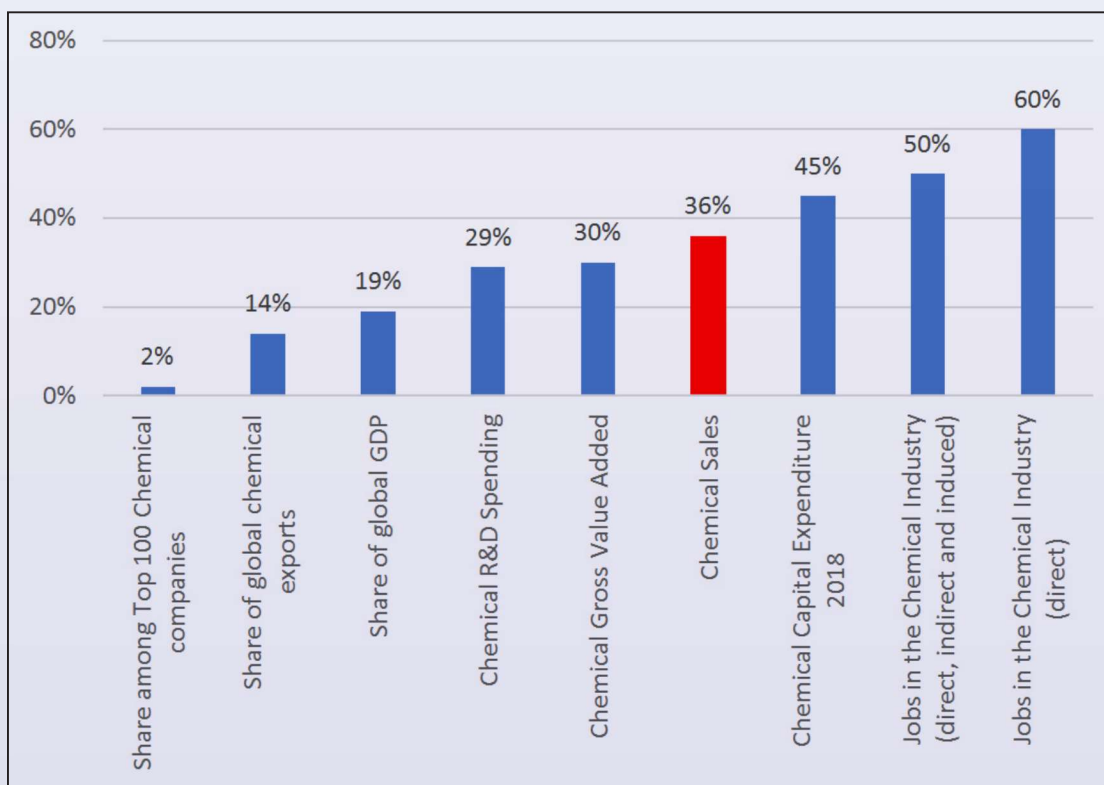


Fig. 1: China share of parameters related to the chemical industry



while that of employees in Europe reaches 150%.

4. China still somewhat underspends on chemical R&D, as the R&D spending (at 29% of global total) is below its share of the chemical market.

This reflects the fact that overall, China's chemical industry still has a lower share of specialty chemicals than that in Europe and the United States. Commodity chemicals producers tend to have R&D spending in the range of 2-3% of total sales while that of some specialty chemicals producers can reach 5% or more. However, China is catching up in this regard, both by investing in domestic R&D projects and acquiring overseas chemical knowledge through acquisitions – therefore, not necessarily reported as R&D but rather goodwill or another M&A related line item. So, the figure of 29% is likely to increase. Fittingly, a study by the scientific journal Nature found that for the first time in 2019, China became leader in the production of high-quality chemical scientific papers, placing the United States in second place. Additionally, China – in particular Shanghai – keeps attracting regional or even global R&D centers of multinational chemical companies, driven both by government support and the desire of companies to locate

their research near important customers.

5. China's chemical industry is still fragmented.

Admittedly, the low number of Chinese chemical companies in the ICIS list (only Sinopec and Wanhua are listed among the top 100 players) reflects partly the mixed nature of companies such as Sinochem, ChemChina and PetroChina. However, it also is an indication that the industry is far more fragmented than in other countries. While over the past few years we have seen a reduction in the number of chemical companies in China, there are still too many smaller and inefficient production facilities, with most of these companies no presence outside of China. However, China's deliberate chemical industry related policies, regulations and economic planning agenda will force a consolidation of the industry.

6. China's chemical industry is comparatively self-sufficient.

Its share of global exports is much lower than its global market share. This is indicative of China's chemical industry having established relatively complete chemical value chains from the production of chemicals to its usage in final products – a difference from other (particularly European) companies which rely to a larger extent on the export of chemicals.

7. China's chemical industry will further increase its global importance.

This is borne out both by statements of companies such as Sabic, BASF and Clariant, and (perhaps more directly) by the large share of chemical capital expenditure allocated to China in 2018. At 45%, it is substantially higher than China's chemical market share. Furthermore, it increased from 29% in 2008 (the development for India, which is sometimes mentioned as a competitor for China in chemicals, was from 3% of global chemical capex in 2008 to 2% in 2018). Forecasts on capacity development of individual chemicals point in same direction. For example, according to individual GlobalData reports, in the period from 2018 to 2023 China will account for about 40% of propylene oxide capacity growth, 44% for acrylic acid, 57% for ABS and 95% for ethyl acetate.

In conclusion, the data points given above clearly demonstrate the high importance, the growth potential, but also the somewhat immature status of China's chemical industry. Admittedly, none of these points are particularly surprising to those familiar with the industry, but underpinning general perceptions with some quantitative data may have a value of its own. ■