



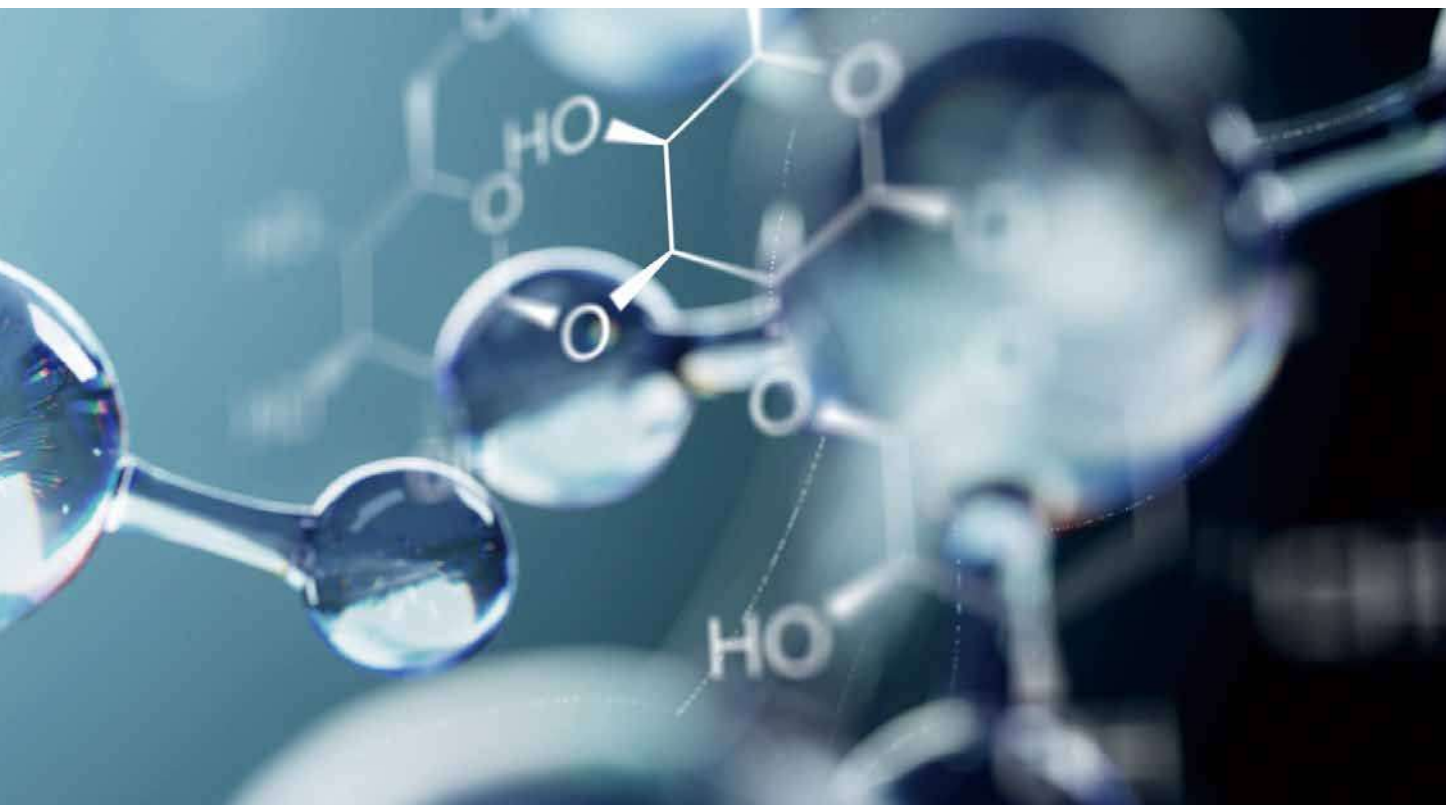
Industry Report:

China's Chemical Industry



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To illustrate the importance of China's chemical industry in the world, we can examine China's sizable share of sales, exports, and imports in the field, as shown in Tab. 1:

Tab. 1: Mainland China's share of the global chemical industry

Parameter: China Share of global	Share	Source
Companies among global top 50 chemical companies	8%	ICIS (2019)
Chemical exports	7%	UNCTAD (2018)
Chemical imports	9%	UNCTAD (2018)
GDP*	19%	IMF (2019)
Chemical R&D Spending	29%	CEFIC, ACC, Oxford Economics (2017)
Chemical Gross Value Added	30%	CEFIC, ACC, Oxford Economics (2017)
Chemical Sales	36%	CEFIC (2018)
Chemical Capital Expenditure	45%	CEFIC (2018)
Direct Jobs in the chemical industry	50%	Oxford Economics (2017)

* Not directly related to chemical industry but included for comparison

Looking at these figures, the most impressive number may be China's share of the global chemical sales – 36%. This makes mainland China alone a bigger chemical market than NAFTA and the EU combined, which together account for 33%.

But a closer look at the other figures reveals the unique characteristics of the chemical industry in China:

- The chemical industry is disproportionally booming in China: while China contributes about 19% of the global GDP, its contribution to global chemical sales is almost twice as high (36%).
- China still focuses on the lower end of the chemical industry, as its share of global chemical gross value added (30%) is lower than its share of the chemical market (36%).
- China's chemical industry still shows lower productivity than the global average. China's high share of jobs in the chemical

industry (50%) is a strong indication of that, as well as direct productivity estimates. For example, Oxford Economics estimates that productivity rates (as measured by gross value added) of chemical employees in APAC is roughly 67% of that of the global average, while employees in Europe reach 150%.

- China still somewhat underspends on chemical R&D, as the R&D spending (at 29% of the global total) is below its share of the chemical market.
- China's chemical industry is still fragmented. While the country accounts for 36% of the global chemical sales, it only accounts for 8% of the top 50 chemical companies. This is partly due to the average size of China's leading chemical companies, which tends to be smaller than in other countries.
- China's chemical industry is still a net importer. China's share of global chemical exports is substantially smaller than its share of imports. For every EUR 100 in chemicals imported by China, only EUR 72 are exported.
- China's chemical industry will further increase its global importance. This is borne out of the large share of chemical capital expenditure allocated to China in 2018: At 45%, it is substantially higher than China's chemical market share.

This positive outlook is reflected both in company statements (e.g., BASF expects China's share of the global chemical market to increase to almost 50% by 2030) and by the variety of recent investments of chemical multinationals in the country. BASF is a good example, with a EUR 10 billion investment in a new site in Guangdong. But many other chemical companies, including ExxonMobil, LyondellBasell, Dow, Shell, and INEOS, have recently announced substantial greenfield investments in China. Other chemical companies have strengthened their presence in China by the acquisition of a local player – such deals have recently happened at a monthly rate, involving companies such as Cabot, Iberchem, Azelis, BASF, Ascend, DIC, and UPL.

What are the reasons for this continued interest of multinationals in China's chemical market? On the one hand, there are general factors, such as the improved 'ease of doing business' in China (as indicated by a World Bank ranking), the continued higher-than-average economic growth, and the relatively fast recovery from COVID-19. On the other hand, there are certain chemical industry-specific factors.

Foreign investment in China's chemical industry has become less restrictive in recent years. A previous requirement mandating joint ventures with domestic companies for petrochemical activities was canceled, playing a decisive role in the investment decisions of BASF and ExxonMobil. The list for prohibited activities has been shortened, while the government has extended the catalog of chemical areas for which foreign investment is encouraged. In fact, in a 2019 survey conducted by the European Chamber of Commerce, 20% of all participating foreign chemical companies indicated that the market had opened significantly, with an additional 13% reporting a 'slight opening,' and only 3% claiming the market is more restrictive. 20% of companies reporting significant market opening was the highest value among all business segments surveyed, showing the impact of lighter government regulation on foreign chemical investment.

Other factors also contribute to China's attractiveness for foreign chemical investment. In particular, China's environmental regulation (and its implementation) has become stricter. While this may, at first glance, sound like a negative development for organizations – most foreign chemical companies see it in a positive light. Foreign players have generally been more observant of existing regulation, less astute at finding ways around it, and possibly more tightly watched by the local authorities. A tighter implementation affecting the chemical industry as a whole thus benefits them, as it levels the playing field with local players. It also increases entry barriers into individual chemical segments by raising requirements, such as investment in emission treatment and safety equipment – eliminating some of the marginal, very small local players that compete with foreign chemical companies.

This consolidation has a positive effect on all larger players in the chemical industry, not only the foreign ones. Prices and margins have generally improved, and in many segments we examined for our clients, more than 50% of all local players have quit production within the last two years or so. Some Chinese industry experts go as far as to claim that this consolidation of the industry – which goes along with price increases and a general improvement in technology and quality levels – is the main objective of the Chinese government, and not environmental protection.

Indeed, policies for some chemical segments strongly push in this direction. For example, in pesticides, the government has imposed a volume growth target of zero for domestic use, forcing companies looking to grow to either increase exports or to develop higher-end pesticides.

According to Fu Xiangsheng, vice chairman of the China Petroleum and Chemical Industry (CPCIF), China's chemical industry can be characterized as "low-end surplus, high-end shortage." This is a concise and accurate description of the industry, highlighting the surplus of companies handling basic chemicals and the shortage in ones producing functional and specialty chemicals. It also indicates where opportunities for foreign chemical companies lie.

The foreign players have – and likely will have – advantages in areas that require a large variety of differentiated chemicals in relatively small volumes, and in innovative formulations that offer properties superior to existing ones. This includes, but not restricted to:

- Battery materials (for use in electric vehicles and others)
- Electronic chemicals with fast innovation cycles
- Engineering plastics
- Flavors and fragrances
- High-end OEM automotive coatings
- Pesticides based on patented active ingredients
- Specialty food ingredients and nutraceuticals
- Specialty surfactants with its large number of differentiated molecules

For these and other chemicals, multinationals increasingly shift to an "In China for China" strategy. That is, rather than importing these chemicals from their overseas plants or using China as an export base, they focus on producing chemicals in China to sell in the Chinese market. This is in line with a broader, global trend of shortening supply chains due to recent events such as the US-China trade conflict and COVID-19. As China is still a net importer of chemicals, particularly specialty chemicals, this approach offers a substantial potential for growth. Recent company statements about their rationale for investing in China illustrate this potential (Fig. 2).

Fig. 2: Investment rationale for recent foreign chemical investments in China's chemical industry



This "In China for China" strategy is also well aligned with the focus on self-sufficiency the Chinese government promotes. As previously mentioned, China is currently a strong net importer of chemicals. According to the CPCIF, in 2019, the trade deficit of the whole industry was USD 268.3 billion. Imports of synthetic resin increased by 12.4%, polyethylene increased by 18.8%, polypropylene increased by 6.4%, polystyrene increased by 13.6%, polycarbonate increased by 12.8%, and pesticide imports increased by 14%. Thus, the goal of self-sufficiency is still far-off.

In particular, this applies to new chemical materials, regarded as important for upgrading China's industry and escaping the middle-income trap. For these, China's 2018 self-sufficiency rate was about 65%. For subsegments, engineering plastics had a self-sufficiency rate of 56%, high-performance fibers – 50%, high-end membrane materials – 67%, and electronic chemicals – 67%. All these areas offer opportunities for foreign companies, and all are included in the government catalog of segments for which foreign investment is encouraged.

Insufficient capacity is not the only issue the Chinese industry faces: China is not producing some chemical materials at all. According to the 2018 statistics of the Ministry of Industry and Information Technology, 32% of the more than 130 key chemical materials were not produced in China at all, and China still depends on imports for 52%, including high-end electronic chemicals, high-end functional materials, and high-end polyolefins. The gap is particularly evident in fine chemicals, which

in China have a share of approximately 45% – much lower than the average levels of 60%–70% in developed countries.

The 14th Five-Year Plan (FYP), which will set out economic goals for 2021 to 2025, might provide a glimpse of the future of China's chemical industry. Based on past announcements and policies, we can identify three key themes in the new FYP that will most likely be highly relevant to the industry.

First, the 14th FYP will most likely continue to highlight the importance of environmental protection. For the chemical industry in China, this will mean that current restrictions and tight supervision will proceed. Chemical production will continue to relocate to chemical parks. Certain chemical segments, that are regarded as highly polluting and not contributing to China's modern economy, may face restrictions: for example, leather chemicals or some dyes. On the other hand, enforcing stricter environmental regulations will also be a boon to many chemical segments that provide relevant materials, such as membranes or lithium salts for rechargeable batteries, polymers and coatings for wind turbines, electronic chemicals for the production of photovoltaic cells, or filter materials used in exhaust cleaning. Further possible restrictions, such as tighter fuel efficiency regulation for vehicles, could benefit the producers of high-end plastics for automotive applications.

Second, the 14th FYP will probably look to boost China's R&D. R&D spending is one of the few areas where China is likely to fail to meet its 13th FYP's targets: in 2019, China's R&D expenditure was only 2.2% of GDP, compared to a 2020 target of 2.5%. Allocating resources to R&D will benefit chemical segments such as electronic chemicals, engineering plastics,

organosilicons, fluoroorganic compounds, membranes for water treatment, etc.

Third, the 14th FYP is expected to focus more on China's domestic market than in the past, and to promote self-sufficiency of chemicals. According to a statement from the CPCIF, China's domestic chemical companies generally lack the extended processing and R&D capabilities, from basic chemicals to fine chemical materials. Reducing China's dependency on imported fine chemicals will mean political support for domestic production. At the same time, the industry's export market – consisting of an already modest figure of 10% of the total market – may decrease further.

Finally, it is safe to assume that the 14th FYP will continue to support the activity of foreign players in the local market, as they will benefit from a shift toward cleaner and more innovative chemistry, utilizing their (often) superior technologies. In contrast, a shift toward domestically produced chemicals will only benefit those multinationals with a production presence in China, while the prospect of importing into China might diminish.

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