論説 Commentary

Japan should actively contribute to the technical advancement of China's chemical industry

Koji YOSHIDA
Visiting Fellow at the Japan Research Center, Fudan University (Shanghai)

Structural reforms in industry approached by the new administration

This year China's new leadership headed by Xi Jinping and Li Keqiang will finally get its start. Up to now even as administrations changed there was no major policy changes implemented in the first term. Accordingly, this time the leaders will likely strive for the vision of scientific development and the establishment of the "harmonious society" advocated by President Hu Jintao. Specifically, the spotlight will be on how the new leaders leave their mark on the execution aspects of the 12th five-year plan (the 12.5 Plan), which has already entered its second year. The new administration is the "fifth generation" counting from the first-generation administration of Mao Zedong. Most of the leaders of this administration have experience studying abroad in the West after China's reform and opening up, so they understand well the principles of democracy and the importance of the cultivation of industry. For those reasons alone, there is anticipation as to what kind of new life they will breathe into traditional Chinese politics and economic management.

Regarding the previous term's plan that ended the year before last, China reported that during five years it achieved an 11.2% average annual growth rate, created 57.7 million new jobs, transferred 45 million workers from the agricultural labor force, and otherwise mostly achieved the goals of the plan. However, the country's endeavors to create a harmonized society by rethinking the overemphasis on economic growth thus far and create new industries through scientific and technological innovation have in reality produced unsatisfactory results. The 12.5 Plan was devised in view of such prior failures, with the focus of industrial policy being placed on industrial technical advancement (scale, technology, added value, etc.), new energy, new materials, and the cultivation of strategic emerging industries. In addition, by expanding employment opportunities through the cultivation of the service industry, which has lagged behind that of advanced countries, the strength of the new administration will be put to the test in terms of how it will promote structural reforms in industry.

The path to the difficult technical advancement of China's chemical industry

It has been a while since China's manufacturing capabilities overwhelmed the world. Even in the chemical industry, China overtook Japan in 2005 in terms of ethylene production quantities and now ranks No. 2 after the United States. China's ethylene demand tops the global rankings with 25% of the market share, and the amount of plastic it consumes has reached double that of second-place United States, at 48 million tons. However, China's per-capita plastic consumption is only around 35 kilograms, compared with 72 kilograms in the United States and 54 kilograms in Japan, which still leaves room to grow. According to a research agency report, China's ethylene demand is expected to grow at 7% per annum for the next five years, while its production is limited to 4 to 5% annual growth due to plant location, raw materials, and environmental issues. Consequently, China's ethylene self-sufficiency ratio is anticipated to fall below 50%, with imports of ethylene delivertives to continue their rising trajectory.

Three main orientations are visible for strategic goals for the chemical industry in the 12.5 Plan. First, in terms of quantitative expansion, is the additional expansion of ethylene and propylene delivertives and other commodity chemicals. Second is the development and strengthening of high value-added products. There is development of engineering plastics, high-performance composites, and other new materials, as well as fine chemicals, biotechnology products, and even products related to strategic emerging industries. Third is the expansion of environment and lifestyle improvement related products and facilities. The environmental-related demand is expected to account for 10% of GDP in 2015.

Particularly, the second orientation toward high value-added products means industrial advances which will not be easy for China. This situation is a result of not devoting resources to research and other activities for technical advancement that take time, although China is able to profit sufficiently from expansion of commodity chemicals. Moreover, China's development thus far has been supported exclusively by expansion of existing products using existing technologies, with little experience creating new technologies and new products. In the high value-added field, introduction of technologies from other countries will not so easy as it has been, leaving what could be called a steep climb to achieve technical advancement.

China should create a climate that bolsters creativity

Looking at China's manufacturing capabilities in terms of production output, we can see that it has the top share in global production for many industrial products. These include steel products, televisions, PCs, mobile phones, and chemicals. In 2009, China also overtook the United States and Japan to even become the No. 1 producer of automobiles, which are representative of integrated products made of sophisticated components. The first factor contributing to the strength of China's manufacturing is of course that most of the technologies could be relatively easily brought in from advanced countries, enabling rapid expansion of production facilities. China was able to take full advantage of its latecomer status. Another factor is that China achieved competitive manufacturing costs thanks to quality improvements owing to enhanced production management capabilities, powerful

domestic sales networks, cheap labor costs, and large production scales.

However, the industrial structure factors behind this level of product generation in a relatively short time period to reach the world's top share of manufacturing must not be forgotten. Although this also has to do with the character of the Chinese people, there is a merchant spirit of bringing finished products to market faster and more cheaply than others, born out of a merchant's capitalist mindset. This has brought about China's unique industrial structure, wherein even though they make finished products including televisions, PCs, mobile phones, all manner of devices, and even automobiles, they buy most of the necessary parts from elsewhere. As a result, many independent part makers are being cultivated with no ties to location. This is in contrast with the Japanese corporations, which have procured key parts and even general-purpose parts from within their corporate group, applied ingenuity through vertical integration, and differentiated their finished products through cross-referencing and assimilation among each of the parts.

The manufacturing culture in China has entailed saving the money and time that would be spent on developing key parts with proprietary core technologies and instead sourcing parts from elsewhere, including Japan, leading to a low level of accumulated technology within the corporations and difficulty in innovating creative technologies. For example, this is also evident in the fact that Japan's chemical companies invest about 3% of their net sales into research expenses, whereas for Chinese firms the figure is about 0.5%. The Chinese government is aware of this low capacity for independent development, and included a policy of promoting scientific and technological innovation in the 12.5 Plan. Although innovation will likely be stimulated to a degree by support from the government, the most important thing is to create an atmosphere and culture that values creativity. Looking at the China of today, one is left with the strong impression that the government, the corporations, and even the individual citizens are in too much of a hurry as if they are being pushed into something and have no room for comfort. In manufacturing, it is essential to create a corporate culture that places importance on taking the time to cultivate proprietary technologies and be creative.

The development of China's chemical industry and Japan's active contribution

Japan and China have a long history of cooperative relationships in the chemical industry. It started with the export of ammonia and urea technologies in the 1970s, continued in the 1980s with export of chemical product technologies for polyolefin, polyvinyl chloride resins, and all types of chemicals, and can be said to have formed the foundation for the development of China's chemical industry of today. Recently, instead of merely exporting technologies, many joint ventures have been popping up using foreign technologies for products in the general-purpose field such as MMA, PTA, and BPA, for which technology is relatively concentrated. Currently, as mentioned above, it is difficult for China to generate high-level products with independent technology, which is a dilemma it is dealing with as a secondary country. Namely China is caught between being relatively weak in comparison with advanced countries if aiming for the cutting-edge fields, and meeting competition from low-income countries in the low-cost general-purpose products field.

This is exactly where Japan can play a role. Japan, with its superior research and development capabilities but sluggish domestic demand and "two lost decades," and China, with its low-cost manufacturing capabilities and voracious demand, should be able to build a win-win relationship. Japan simply needs to bring its leading-edge technologies to China and demonstrate a posture of actively contributing to new manufacturing in concert with China. The 12.5 Plan designates intensive fields to be cultivated as especially strategic emerging industries, and aims to expand them to comprise 8% of GDP. Specifically, the plan mentions seven industries, including energy conservation and environmental preservation, high-end device manufacturing, new energy vehicles, and new materials. Japan's chemical industry has already started selling individual products in the energy conservation and environment sectors, which it is skilled in, but it would be better to see full-fledged forays all the way into integrated services that include materials, facilities, and systems. In addition, it would be better for Japan not to merely supply materials and parts for aircraft, high-speed railways, and other high-end equipment manufacturing or new energy vehicles, but rather to make efforts with modularization of core parts and materials or selling them as sets with processing technologies. Especially for electric cars, since there is expected to be a global-scale shift in manufacturing structure, their development will not merely entail the development of batteries, but also motors, charging systems, social infrastructure, and other components of total systems, all of which underscores the importance of the Japan-China joint approach.

There is hesitation on the Japan side about joint development with China in state-of-the-art technology due to the proliferation of imitation goods and downplaying of intellectual property rights in China. However, considering the recent more stringent handling of such violations by the government and the improving awareness of Chinese businesspeople, it would be desirable for Japan to deepen its contributions to China in cutting-edge technology fields before other countries do, with an active posture of joint development even while simultaneously advancing in both the domestic and Chinese markets. Since such efforts span a very broad range, I would like to make a strong appeal for approaching this challenge as a national project with the support of the government, wherein the public and private sectors, as well as companies in different industries, form a "Team Japan" for this purpose. This is the kind of daring change in way of thinking that is needed to dispel the sense of stagnation currently pervading Japan.

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E-mail: ronsetsu@chemistry.or.jp

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