

How Japan's chemical industry can overtake the world

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The age of the chemical industry

It has already been 20 years since Japan's economic bubble burst. For a while the 1990s were being called the "lost decade," but lately I have started to come across the expression "lost two decades," which is to include the 2000s. Japan's economic slump continues even now.

To break out of this rut and regain its vitality, the Japanese economy needs to see a new leading industry emerge to drive the economy as a whole, as the automotive and electronics industries did in the past. Then, which industry could become the next leading industry? I believe it is the chemical industry, and I recently issued a book entitled *The Age of the Chemical Industry: Why Japan Can Overtake the World* (The Chemical Daily, 2011) with So Hirano, full-time lecturer at Seijo University. In this article I will present the main ideas discussed in the book.

The strengths of Japan's chemical industry

Up to now, Japan's chemical industry has been considered a moderately "weak industry" lacking in international competitiveness. However, examining the facts reveals a different picture. In terms of high value-added functional chemical materials—such as protective films for LCD (liquid crystal display) polarizers, compound semiconductors, carbon fibers, cathode and anode materials for lithium batteries, and silicon wafers—Japanese products have a far larger global market share than automobiles, electronic devices, and electronic parts. If we focus on this point, we can see that there is substantial potential for the chemical industry to be a leading industry.

On March 11, 2011, the Great East Japan Earthquake drove Japan into an even worse situation to aggravate the "lost two decades." This earthquake was an additional blow to Japan's economy. However, what I would like to focus on here is that the earthquake resulted in a bottleneck in the supply of functional chemical materials, which impacted the production of assembly manufacturers not just in Japan, but all around the world. This occurrence underscored the "strength" of Japan's chemical industry.

Two challenges to be overcome

Japan's chemical industry is of course dealing with several challenges, and it will not be capable of becoming the next leading industry and overtaking the world unless these issues are overcome. The following two challenges are the major ones deserving particular mention.

First, Japan's chemical manufacturers trail the top manufacturers in the United States and Europe in terms of business scale. This is in contrast with the automotive and electronics industries, which achieve sales on par with or greater than manufacturers in

the West. In order to become the leading industry, the chemical industry will have to successfully expand the scale of its operations.

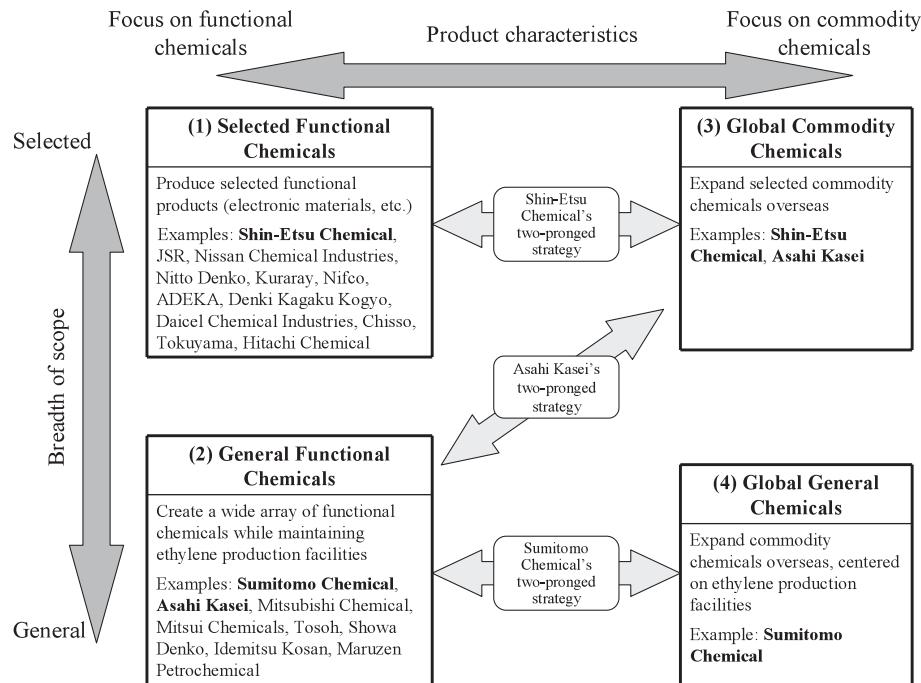
Second, even as Japan's chemical manufacturers supply high valued-added materials to Japan's assembly manufacturers (automakers, electronics manufacturers, and others), the assembly manufacturers have often held the reins within the supply chain. It is an undisputed fact that Japan's chemical industry has honed the competitive edge of its products through detailed "back-and-forth" processes with assembly manufacturers. However, recently the international competitiveness of Japan's assembly manufacturers in itself has been falling, due to reasons such as: (1) It is not always only high-quality products that are being demanded anymore, (2) high-quality products are also being produced as commodities in other Asian countries with low costs, (3) Cases are starting to crop up where Japanese assembly manufacturers that got their start in domestic production and later expanded internationally have fallen behind overseas assembly manufacturers that have been developing products to reflect the needs of emerging markets from the beginning, and (4) they are being outstripped by companies in the United States and Europe in terms of standardization and business models. To become the leading industry, the chemical industry must additionally secure the leading role within the supply chain, gain independence from assembly manufacturers, and turn the fruits of its move to high value-added products into revenues.

High-revenue scenarios for chemical manufacturers

The diagram summarizes the results of analysis of the above-mentioned "The Age of the Chemical Industry." As shown in the diagram, the high-revenue scenarios that Japan's chemical manufacturers could adopt can be divided into four types in terms of chemicals produced:

- (1) "Selected functional chemicals," concentrating on the high-performance product business in specific
- (2) "General functional chemicals," where the high-performance product business is transitioned to the center while maintaining ethylene production facilities
- (3) "Global commodity chemicals," expanding selected commodity chemical businesses globally
- (4) "Global general chemicals," expanding the ethylene production business globally

From the diagram it is clear that the basic strategy of Japan's chemical manufacturers is to transition to high value-added products. The majority of the manufacturers are pursuing scenarios (1) or (2). However, Shin-Etsu Chemical, the world's top polyvinyl chloride supplier, and Asahi Kasei, which is the No. 2 global acrylonitrile supplier, are both tackling scenario (3) as well.



Moreover, Sumitomo Chemical, which is advancing the Rabigh Project in Saudi Arabia, can also be said to be executing scenario (4) at the same time. In effect, Shin-Etsu Chemical is pursuing (1) and (3), Asahi Kasei is pursuing (2) and (3), and Sumitomo Chemical is pursuing (2) and (4), so that they are each taking on two-pronged strategies.

The importance of two-pronged strategies

In order for Japan's chemical industry to become the next leading industry, a two-pronged strategy that addresses both the high-end and low-end market is indispensable. The reason is that following the strategies for scenarios (1) and (2) in the high-end market means rising to the second challenge mentioned above of turning the fruits of the switch to high value-added products into revenues, and approaching the low-end market with scenarios (3)

and (4) is an unavoidable hurdle to be passed in order to meet the first challenge of expanding business scale. If Japan's chemical industry can deploy a two-pronged strategy to overcome these two challenges at the same time, it can become the next leading industry and overtake the rest of the world.

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