

Chugoku Recharged

Two industrial cluster projects under way in Chugoku are successfully driving the development of next-generation industry in the region, as companies reap the benefits of improved collaboration among business, academic, and administrative sectors. **Tamura Mariko** reports.

The Chugoku region of southwest Japan has long been a center for automobile, shipbuilding, industrial machinery, and other businesses. It is also home to a large number of local manufacturing companies possessing advanced technologies, knowledge, and human resources. However, these industries are already in the mature phase. Related businesses are now being urged to seek further advancement or expansion into promising sectors given a trend toward global restructuring and intensifying competition among businesses. In the Chugoku region, a project to help create and cultivate those businesses that can successfully operate worldwide is now underway.

There are two projects underway as part of the industrial cluster program for the Chugoku area. The first is the Project to Create the Next Generation Core Industry, which defines mechanical systems such as advanced medical instruments and robots and machining processes for production of items such as aviation parts as key support areas, along with next-generation industrial fields such as bio-technology and information technology. The second project is the Project to Form a Circulative and Environmental Type of Industry aimed at supporting related industries to form the three sub-clusters of resources recycling, circulative biomass, and environmental cleanup and restoration.

"This region has an accumulation of machinery industries, such as automobile, shipbuilding, and industrial machinery, as well as steel and petrochemical complexes." Masumoto Isao, an assistant manager in the next-generation industry section of the regional economy department of Chugoku Bureau of Economy, Trade and Industry (METI Chugoku), explains the potential in this district. He goes on to point out that the collaboration among the business, academic, and public sectors is encouraging individual firms to seek out the future prospects for new industries, saying, "The companies that support them have ample human resources, technologies, and expertise. They are increasingly entering new growth sectors using their resources and development for further advancement in existing fields."

The Industrial Cluster Forum was set up in the Chugoku New Business Conference (which is chaired by Matsusaka

Keitaro, in the city of Hiroshima), and plays a role in the central promotional body. It is aimed at facilitating the implementation of the two projects and further collaboration among the business, academic, and administrative sectors.

At the moment, the Forum has some 110 companies and 13 universities participating in the Project to Create the Next Generation Core Industry and 105 businesses and 13 universities in the Project to Form a Circulative and Environmental Type of Industry. Local governments, public research institutes, and business support organizations are also involved in these projects. The Forum's basic activities include the construction of human networks, provision of opportunities for exchange among the business, academic, and administrative sectors, the organization of study groups, and business matchmaking services.

METI Chugoku explains, "Patent distribution advisors and specialized coordinators visit companies together with our staff to survey their core technologies and their needs. They perform matchmaking between universities' seeds and business needs, and create databases." The METI office is eager to help small and midsize companies enter new markets and create new businesses.

In March 2005, the Chugoku Advanced Medical Instrument Business and Other Cluster Creation Fair was held at Hiroshima Sanyo Kaikan (Hiroshima Industrial Hall). Aimed at forming an industrial cluster in advanced medical engineering-type instruments, the two-day fair attracted some 1,500 visitors.

"We will actively demonstrate to the rest of the country the new power of manufacturing that is generated

from the region," says METI Chugoku, explaining the purpose of the fair.

Propellers and Plasma

In fact, some companies in the Chugoku area have expanded their operations into entirely new markets and have successfully achieved business growth there.

A typical example is Nakashima Propeller Co., based in Okayama-shi city, Okayama-ken prefecture (president, Nakashima Motoyoshi). Employing the state-of-the-art technology it developed in propeller processing, it has entered the medical business.

This company boasts the world's largest market share in the manufacture of all types of propellers (or screws) for vessels, ranging from 100,000-ton class ships to motorboats. For fifteen years or so, it has also been developing and manufacturing artificial joints made of titanium alloy and other materials. It takes advantage of support programs for technical development. In November 2002, it released artificial hip joints developed through joint research with a team that included Asahikawa Medical College and Hokkaido University.

Nakashima Yoshio, executive director of Nakashima Propeller, remarks on the

Chugoku Region



Tottori Prefecture

Total	3,507 km ²
Total population	614,650 people
No. of households	216,963 households
Value of manufacturing output	1,025,800 million yen

Shimane Prefecture

Total	6,707 km ²
Total population	752,534 people
No. of households	267,189 households
Value of manufacturing output	1,003,400 million yen

Okayama Prefecture

Total	7,009 km ²
Total population	1,957,269 people
No. of households	732,253 households
Value of manufacturing output	6,289,500 million yen



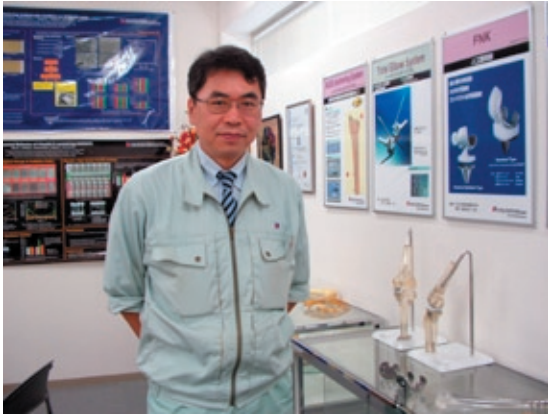
Hiroshima Prefecture

Total	8,477 km ²
Total population	2,869,555 people
No. of households	1,161,859 households
Value of manufacturing output	6,556,300 million yen

Yamaguchi Prefecture

Total	6,111 km ²
Total population	1,512,333 people
No. of households	620,630 households
Value of manufacturing output	4,951,300 million yen

Source: METI CHUGOKU



Nakashima Yoshio, executive director of Nakashima Propeller Co. (left); the company's artificial knee joints made of titanium alloy and other materials (right)

need for advanced processing techniques: "Artificial knee joints need grinding until their surface becomes mirror like. We can only make two or three such units per worker per day."

"Propellers are manufactured on a vessel-by-vessel basis. Our unique and extensive techniques, ranging from complicated computer-based three-dimensional design to artisanal metal processing, are used to manufacture artificial joints that operate in a complex manner in the human body." Nakashima underlines that the company's own expertise, which was cultivated in a conventional field, has assisted its move into this new area.

In the 1980s, when the shipbuilding industry was slumping, Nakashima Propeller moved into the artificial joint sector, armed with titanium-based artificial joints it had developed with its existing technologies. As Japanese society ages, there is increasing demand for artificial joints. This company is now number two in Japan in the market generated by orthopedic surgery and is expanding production facilities. Manufacturing artificial knees, elbows, hips, ankles, fingers, and other joints, it has sales of approximately 1.8 billion yen per year.

"We plan to bolster annual sales to nearly 5 billion yen (45 million dollars) in four or five years," Nakashima says. "Going forward, we will aim to achieve sales of 10 billion yen to make this a mainstay business that matches our main propeller operations."

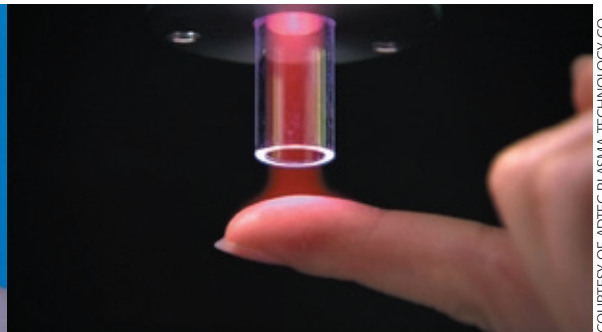
Another growing company is entering a new business sector. The president and staff of the company have been rushing around Europe and the United States.

That company is ADTEC Plasma Technology Co. (president, Fujii Shuitsu). Based in the city of Fukuyama in Hiroshima-ken, it has developed high-frequency plasma power generators for semiconductor manufacturing. It is now number one in Japan and number three in

the world in terms of sales of high-frequency plasma power generators.

In September 2001, Fujii invited a professor who had retired from a public university to launch a research organization with the brief of tracking and controlling the plasma status at the company.

"In the past, high frequency plasma generators were prone to trouble. They



Fujii Shuitsu, president of ADTEC Plasma Technology Co. (left); low-temperature plasma produced under atmospheric pressure (right)

gave us problems at least once a year." Fujii started working on plasma in 1990.

"In 1991, inspired by car shock absorbers, we managed to complete the development of innovative high-frequency plasma generators that excelled in stability," says Fujii. Despite the disadvantage of small businesses, he adopted the three-month free rental system. This bolstered sales to quickly bring his company to the top of the industry in Japan.

The company is today aiming to enter the medical and environmental sectors. One project involves developing equipment that generates low-temperature plasma under atmospheric pressure. The development is taking place in collaboration with the Max-Planck-Institute, a noted German research institute in the medical field, and the Medical University of Munich.

"In surgery, application of low-temperature plasma to the sewn area instantly sterilizes the area and stops bleed-

ing, to prevent suppuration and enable the area to heal more quickly. We hope that this technology will find clinical application in three to five years," explains Fujii. "Because it is low-temperature, it can be applied to human bodies. We think it will have uses in the medical and environmental fields."

"Plasma is the energy of the universe. If it can be fully utilized under atmospheric pressure on Earth, the world will change," he says, eyes shining. Fujii will continue to pursue his ambitions.

Growing Businesses

"We hold study groups. We open experimental facilities. We engage in active exchange, mainly with local researchers but with overseas researchers as well. With these actions, we are working to develop more advanced technologies," says Nakashima. Participating in the industrial cluster program, Nakashima Propeller aims to create new products based on the local characteristics.

Notes Fujii, "I think that, during its period of rapid economic growth, Japan lost the formative experience through which

children can grow up in their community. This pristine aspect still remains in Bingo (eastern Hiroshima-ken)."

Together with Sakiya Fumio, president and CEO of Rorze Corporation, based in Kannabe-cho, Hiroshima-ken, Fujii has organized a workshop for young people and set up the Bingo Semiconductor Technology Enhancement Conference (BISTEC), which has the objective of creating a sound local community through collaboration among industry, academia, and government.

Growing businesses in the Chugoku region value their local communities. These businesses are employing original technologies owned by manufacturing businesses and are collaborating and integrating with technologies in other fields. Their progress in new fields will be interesting to see. ■

TAMURA Mariko is a bureau chief of the Japan Academic Society for Ventures and Entrepreneurs.