

## Special Feature Article The Year 2023 and Beyond

~Electric vehicles and automated driving will be the key~

Auto parts manufacturers are reorganizing their supply chains and accelerating the capacity expansion of their domestic facilities. In order to respond to automakers' battery electric vehicle strategies and the full-fledged spread of automated driving, companies need knowledge that differs from the areas in which they have strengths, and it appears that acquisitions and business alliances with companies that possess such knowledge are becoming more common. In addition to such supply chain restructuring, it is also essential to strengthen the supply chain. The situation in Ukraine, sharp exchange rate fluctuations, and the ongoing decoupling of the economies of the U.S. and China have led to an increase in the capacity of domestic facilities as a means of risk diversification.

### Automakers Strengthen Supply Chain and Bring Technology In-House

Since the government's "Make new car sales 100% electric cars by 2035" goal was set, automakers have been focusing on their battery electric vehicle strategies. To promote in-house production along with the promotion of electrification technology, the supply chain will be strengthened through collaboration and capacity expansion of domestic facilities. Toyota Motor Corporation plans to invest up to 730 billion yen in Japan and the U.S. to begin production of automotive batteries in 2024 or later. Of this amount, 400 billion yen is planned to be invested in Japan, with investment for batteries made in Japan to be the first, and costs to be lowered through the in-house production of new technologies. In addition to the Himeji Plant (Himeji City, Hyogo) of Prime Planet Energy & Solutions, a joint venture with Panasonic Corporation, capital investment in battery production in Japan is also planned at Toyota's parts plants in Miyoshi City, Aichi Prefecture, namely the Myochi Plant and Shimoyama Plant.

Mazda Motor Corporation will collaborate with auto parts manufacturers, mainly in the Chugoku region, in the development of the "e-Axle." It has established joint ventures with Imasen Electric Industrial Co., Ltd. and FUKUTA ELEC. & MACH. CO, LTD. in Taiwan, and with ONDO CORPORATION and HIROSHIMA ALUMINUM INDUSTRY CO., LTD. in the production technology and supply system for electric drive units, respectively. The strengths of each company will be integrated to promote the in-house production of technologies that will lead to increased competitiveness, such as battery electric vehicles (EVs) and automated driving, throughout the supply chain.

Nidec Corporation, which manufactures e-axles, is accelerating mergers and acquisitions (M&A) to bring related technologies in-house. In 2021, Nidec Corporation will

acquire Mitsubishi Heavy Industries

Machine Tool Co., Ltd., which manufactures equipment for gears, the main component of e-axes. With the shortage of semiconductors and other factors making it difficult to procure equipment, etc., making the equipment manufacturer a subsidiary will lead to stable procurement of gears, as well as shorter delivery times and lower costs for e-axes.

MinebeaMitsumi Inc., which sees the automotive field as a growth business against the backdrop of the shift to EVs and other factors, has acquired Honda Lock Mfg. Co.,Ltd., a Honda-affiliated supplier of key systems and door handles, in addition to HONDA TSUSHIN KOGYO CO., LTD., which manufactures in-vehicle cameras, and Sumiko Tec Co., Ltd., which produces in-vehicle lamps and other products. MinebeaMitsumi Inc. is aiming to add high value to its products by expanding its product lineup and leveraging the technologies of both companies.

In the area of supply chain enhancement, some parts and materials manufacturers are aggressively increasing the capacity of their domestic facilities. BASF TODA Battery Materials LLC, a joint venture between Germany's BASF and TODA KOGYO CORP., will expand its production capacity of high nickel cathode materials (CAM) at its Onoda Plant (Sanyo-Onoda, Yamaguchi). Production is scheduled to begin in the second half of 2024, with an annual production capacity of 60,000 tons of cathode materials by 2025.

Asahi Kasei Corp. will build a new plant within the premises of its existing plant in Hyuga City, Miyazaki, to increase production capacity of HIPORE separators for lithium-ion batteries, with plans to start operations in the first half of FY2023. Asahi Kasei plans to increase production capacity of separators for lithium-ion batteries, for which demand is growing due to electrification, and aims to maintain the top share in the global separator market.

Companies are working to increase their production capacity of automotive batteries, which are considered the "heart of EVs," including related materials. The Ministry of Economy, Trade and Industry (METI) also plans to launch a new initiative to support the development of all-solid-state batteries in FY2023. In addition to working on the establishment of basic evaluation technologies, including standard battery models for performance evaluation, METI plans to support the development of new materials for electrodes and cells (single batteries).

### Trends of component manufacturers outside the battery field

In addition to automotive batteries, component manufacturers of motors and electric compressors, which are key components for electric vehicles, are also renovating their domestic production bases and increasing capacity. NHK SPRING CO., LTD. is active in increasing production of motor parts for EVs. The company plans to increase the production capacity of products for electrification at its Atsugi Plant (Aikawa, Kanagawa)

and Komagane Plant (Komagane, Nagano). The Atsugi plant will expand its existing building by the end of FY2023 to increase production capacity of motor cores used in motors for driving EVs and hybrid vehicles (HVs). The company also plans to expand its plants by FY2025. The Komagane Plant will increase its production capacity of metal substrates, for which demand is expected to grow for use in power modules in conjunction with the electrification of vehicles.

Component manufacturers of heat exchanger products, such as electric compressors for car air conditioners, are also actively expanding their production capacity in Japan to increase production in anticipation of the expansion of the electric vehicle market and to prevent the outflow of technology. There are high expectations for heat pump systems using electric compressors to efficiently generate heating in EVs and for thermal management systems to utilize thermal energy of the entire EVs without waste.

Toyota Industries Corporation will double the size of its Higashiura Plant (Higashiura, Aichi) to build a new processing line dedicated to electric compressor parts. The plant will expand its area from the current 28,000 square meters to 52,000 square meters. The company also plans to increase its global production capacity of electric compressors to 10 million units by the end of FY2023.

SANDEN CORPORATION, which manufactures air conditioning systems for automobiles, is also reviewing its production system in response to the shift to electric vehicles. The company is consolidating its plants that manufacture heat exchangers in Asia from four to two, and will also consolidate its plants that manufacture exhaust pipes for air conditioners from two to one by the end of FY2022. Meanwhile, at its domestic Yatsutajima Plant (Isesaki City, Gunma Prefecture), the company is increasing the production capacity of electric compressors, for which demand is expected to increase for use in electric vehicles. The production capacity will be raised by automating the electric compressor line.

In addition to component makers involved in these heat exchangers, interior component makers will also focus on technologies to further improve quietness and to provide new value by taking advantage of such technologies, since EVs have no engine noise. In the case of self-driving vehicles, a new cabin space will be designed, so comfort will be more important. By aligning the knowledge of related companies, they are seeking to realize vehicle interiors that are appropriate for next-generation vehicles, such as automated vehicles.

TS TECH Co.,Ltd. and ALPS ALPINE CO., LTD. are strengthening their collaborative relationship in the development of interior spaces for next-generation vehicles. They have jointly developed "XR CABIN," a proposal for next-generation vehicle interior space in anticipation of the age of automated driving. The product embodies multiple technologies required for the cabin space of future automobiles, such as relaxing seats.

Also, the ALPS ALPINE CO., LTD. has formed a capital and business alliance with NIPPON SEIKI CO., LTD. centered on the development of integrated cockpit products. The integrated cockpit integrally manages and displays information previously displayed by center information displays and head-up displays (HUD), such as vehicle speed, engine and motor RPMs, remaining battery capacity, and various warning lights. By integrating the control of each device, the number of electronic control units (ECUs) can be reduced, which also has the advantage of reducing costs. Full-scale installation of integrated cockpits in next-generation vehicles is expected.

With the spread of electric vehicles and automated driving, vehicles are expected to become even more electrified. Electronic component makers, seeing this as a commercial opportunity, are expanding their domestic production systems.

KYOCERA Corporation will build a new plant in Satsumasendai City, Kagoshima, to produce semiconductors such as organic packages for advanced driver assistance systems (ADAS) and sensor cameras for automatic driving. The investment will be approximately 62.5 billion yen, and the plant is scheduled to start operations in October 2023. Demand for organic packages is growing due to the spread of advanced driving support systems, and the company will increase its production capacity. The new plant will also produce packages for quartz devices.

TDK Corporation will also increase its production capacity of multilayer ceramic capacitors (MLCC) for EVs and ADAS. It will invest about 50 billion yen to build a new manufacturing building on the premises of TDK Electronics Factories Corporation' Kitakami Plant (Kitakami City, Iwate), with mass production scheduled to begin in September 2024. In addition, Murata Manufacturing Co., Ltd, ISHIHARA SANGYO KAISHA, LTD., and its subsidiary Fuji Titanium Industry Co., Ltd. (Nishi-ku, Osaka City) have signed a basic agreement to establish a joint venture company for pallium titanate, which is necessary to produce MLCC. This is intended to cope with a supply shortage of barium titanate, demand for which has remained at a high level worldwide.

#### 40% of manufacturers are considering shifting procurement to domestic sources

CADDi Inc. (CEO: Yushiro Kato, Taito-ku, Tokyo), a sheet metal processing and other contract manufacturing company, recently released the results of a survey on geopolitical risks targeting the manufacturing industry. In the survey, nearly 40% of the respondents said that the automotive industry would review its overseas procurement sources to move to Japan. While China's lockdown (urban blockade) and the situation in Ukraine were cited as medium- to long-term risk factors, the survey also found that the review is not progressing as well as expected.

When 151 automotive-related businesses were asked about their specific policies for review, the most common responses were "to shift overseas suppliers to domestic"

(37.7%), "to diversify areas, etc. of suppliers both in Japan and overseas" (33.1%), and "to diversify regions of domestic suppliers" (31.8%). Only about 15% of all respondents answered that their review of suppliers was "proceeding as planned," citing cost and quality issues as reasons.

When 152 factory managers and general managers or higher were asked about challenges in finding new suppliers, the most common responses were "cost is not suitable" at 53.9% in Japan and "quality level is not suitable" at 46.7% in overseas markets. Some respondents in Japan (39.5%) and overseas (31.6%) also answered that "the work of (their) procurement staff is strained" and "communication with new suppliers is time-consuming."

As the global situation becomes increasingly uncertain, it is also necessary to establish supply chains with taking account of measures to prevent the outflow of materials, technologies, and know-how in the interest of economic security. In addition to responding to the demand for electric vehicles, self-driving cars, and next-generation vehicles, auto parts manufacturers will continue to search for the best solution for their supply chains.

