COMMENTARY

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Electrical Energy Storage Business of Hitachi Chemical Contributing to the Secure Social System and Environmental Conservation

Nowadays, mid- to long-term issues which significantly impact on social environments, such as global warming, natural resource problems and the advance of an aging society, are piled up. At Hitachi Chemical, we have defined “Information/Communication & Display”, “Automobile & Transportation infrastructure”, “Environment & Energy” and “Life Science” as our priority business areas and are working to create new products and new businesses as well as offering various materials and components. Specifically we aspire to expand our business in the focal areas of “Environment & Energy” and “Life Science”, where significant growth is set to be achieved.

In the environment & energy business sector, Shin-Kobe Electric Machinery Co., Ltd. became our wholly owned subsidiary in April 2012 to help catalyze our core electrical energy storage device business, swiftly respond to facilitate globalization of our business and consolidate our energy storage business. Thanks to this merger, new product development is being accelerated, amid positive synergy by exploiting the competitive advantages of battery development/manufacturing and power supply system technologies owned by Shin-Kobe Electric Machinery and material technology together with material analysis and interpretation skills which we have nurtured since our company was founded.

At Hitachi Chemical, we are expanding our electrical energy storage device business in two areas, namely industrial and automotive applications. In the industrial area, people have become acutely aware of the need to secure power supply sources in emergencies or the tight supply-demand balance and save electrical power and energy by using electrical power more efficiently in the wake of the Great East Japan Earthquake. Moreover, business enterprises are also promoting such measures from the business continuity planning (BCP) perspective. The market for electrical energy storage systems is henceforth expected to grow as the key equipments, to shift peak load and energy management in targeted areas and communities during normal operation as well as emergency electrical power sources. In addition, amid efforts to counter global warming, there are rising expectations of non CO_2-emitting renewable power sources, such as wind power and solar power (PV). However, the issue of power system instability emerges if a considerable proportion of electricity is generated from renewable energy sources. This is due to irregular fluctuations in electric power generation, which is heavily dependent on weather conditions, in response to which the increased integration of electrical energy storage systems is expected to mitigate and stabilize output power fluctuations. Our company has already developed and launched an electrical energy storage system using a lead-acid battery with an expected service life of seventeen years and started delivering the same since 2009. In the industrial sector, our company has continued to promote the lead-acid battery business mainly including backup power systems for office equipments

and phone base stations and the capacitor businesses for power inverter circuits of wind power/solar power (PV) generators and various power supply sources. We are determined to meet needs appropriately as mentioned above and focus on developing and commercializing electrical energy storage devices and systems, which can contribute to a steady energy supply and help achieve a low-carbon society while continuously developing a new device business such as lithium-ion batteries and capacitors. In the automobile sector, development and popularization of fuel-efficient cars, are advancing especially cars with idling stop systems (ISS) are expected to become particularly popular, because of the fuel efficiency can be improved economically. Our company continues to focus on improving the performance of lead-acid batteries for cars with ISS and help reduce carbon dioxide emissions by boosting the fuel efficiency of cars with ISS.

In response to our prevailing business environment, we strive to grow our electrical energy storage device business into the third core business following those of high-performance materials and automotive parts. One great feature of our business portfolio is possessing the four distinctive electrical energy storage device products, namely lead-acid battery, lithium-ion battery, lithium-ion capacitor and conventional capacitor businesses and further power supply equipments and electrical energy storage system products. We strive to continue growing our device business by optimally exploiting our advantage, with hybridization as one option. Various electrical energy storage system needs are required, depending on the applicable capacity zone and applications, and meeting such needs with a single type of device is not always appropriate. In this respect, our hybrid electrical energy storage system, which combines multiple types of unique devices, can optimally fulfil wide-ranging requirements in terms of performance, cost and other needs. We want to provide electrical energy storage solutions optimized for various applications by enhancing the features of four different electrical energy storage devices and combining their performances. We will also continue further globalization and expansion of our business portfolio. We accelerate expansion of our business cooperatively as a team with Hitachi Group companies and by utilizing the abundant resources available in the Hitachi Group. As for global deployment, one example includes the power grid stabilization business in North America, where we started verification tests on an ancillary (frequency regulation) service in June 2014, using a container-type electrical energy storage system “CrystEna: developed by Hitachi, Ltd.” incorporating our lithium-ion batteries. As for expansion of our business portfolio, we attempt to expand our business into new electrical energy storage system applications as the main focus, also including battery status monitoring and service businesses such as energy management and maintenance.

Our company is developing a range of products, in environment & energy business fields including high-performance materials for solar cells and other materials for wind power generator and thermal management as well as electrical energy storage devices. In this Hitachi Chemical Technical Report, we would like to introduce some of our activities in environment & energy fields. As the environmental & energy issues becoming more serious, we hope to play our part in solving and overcoming these issues and achieving a low-carbon society. We hereby pledge to follow through with our corporate philosophy, which involves contributing to society through technical advancement and products that can herald a new era, toward the realization of a sustainable society.