

# An Ongoing Commitment to Creativity and Innovation to Improve People's Lives

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Today, we are living in a rapidly changing world with diverse global challenges—energy supply, resources, the information revolution, and population issues, to name just a few—and these challenges are becoming ever more complicated.

Under these circumstances, the Toshiba Group is committed to doing its part to help address global issues with a focus on the three pillars of its business: energy, storage, and healthcare. Our vision is to create an ideal Human Smart Community, where people live in peace, safety, and comfort. To realize this vision, we are striving to deliver not only creative and innovative products but excellent user experiences as well, because we understand that customers find greater value in the new or enhanced experiences offered by products than in the products themselves. In line with this goal, our aim is to bring together the essence of our technologies, product development expertise, and *monozukuri* techniques (the art and craft of manufacturing). We will continue to deliver unique value to our customers to fulfill their present and future needs, and further accelerate our efforts to achieve growth through creativity and innovation.

The following is a brief summary of our achievements over the past year.

In the energy and social infrastructure field, we have constructed combined-cycle thermal power plants with a short lead time in order to ease the tight power supply after the Great East Japan Earthquake. We have also developed various systems, including a remote control system specifically designed to remove fuel from the disaster-stricken Fukushima Daiichi Nuclear Power Station. In keeping with our commitment to the promotion of renewable energy, we have delivered high-speed, large-capacity, adjustable-speed pumped-storage hydropower systems and geothermal power generation systems. Moreover, to help meet the world's energy demand, we have shipped various products designed to improve transmission and distribution efficiency. For railroad vehicle applications, we have developed the world's first propulsion system that employs a variable-voltage variable-frequency (VVVF) traction inverter incorporating silicon carbide (SiC) diodes to drive permanent magnet synchronous motors (PMSMs). In addition, our newly developed solid-state weather radar for ocean vessels is contributing to the promotion of a safe, secure, and comfortable society.

We have also been active in the field of community solu-

tions, as shown by our involvement in the Yokohama Smart City Project (YSCP) as well as demonstration projects sponsored by municipalities such as Miyakojima in Okinawa. The objective of these projects is to improve energy utilization efficiency using a wide range of technologies such as community energy management system (CEMS), building EMS (BEMS), and home EMS (HEMS) technologies. In the years ahead, we will deploy these technologies, systems, and services in many cities and regions in order to realize smart communities.

The healthcare field has witnessed various innovations in diagnostic imaging, including Japan's first X-ray diagnostic system that can be used for intravascular interventional procedures throughout the body and an integrated large-bore positron emission tomography/computed tomography (PET/CT) system using time-of-flight (TOF) technology. Furthermore, we have introduced a genotyping service for ethnic Japanese to promote disease prevention and therapies tailored to each individual.

In the field of electronic devices, we have developed the world's smallest 128 Gbit multilevel cell (MLC) NAND flash memory, fabricated using 15 nm process technology, in cooperation with SanDisk Corporation. Additionally, we have released new 3.5-inch nearline hard disk drives (HDDs) with the industry's highest storage capacity and expanded our portfolio of image recognition processors targeting the growing automotive imaging market.

The Lifestyle Products and Services segment has released the dynabook KIRA L93 notebook PC that can be transformed into seven different forms according to the usage scenario, as well as the REGZA Z10X series of 4K (3 840 × 2 160-pixel) TVs.

Recognizing that information and communication technology (ICT) will support innovation in the Internet of Things (IoT), in which all digital devices will be interconnected, we have expanded the service area for global cloud platforms, increased cloud services, enhanced their reliability, and developed solutions for further promoting analysis and use of big data.

This is just a snapshot of the technological innovations achieved by the Toshiba Group. We hope that you find *TOSHIBA REVIEW Science and Technology Highlights 2015* a useful companion for better understanding of our leading-edge technologies, and would appreciate your feedback, suggestions, and comments as always.