

Increasing Expectation for Power Electrics Applied Technology

Yoshio Okuno

Fuji Electric Systems Co., Ltd.

Inverters, uninterruptible power supplies and other products incorporating power electronics technology are currently used at various public locations and in various market sectors. For example, the trains you may ride during your morning commute and the elevator you may ride up to your office are driven by motors that are controlled by inverters. Also, the computers comprising the backbone of an IT system that provides work support are protected from power failure by uninterruptible power supplies, and power supplies, servo systems and the like are also used inside office automation equipment. Thus, power electronics technology, which is one of Fuji Electric's strengths, is indispensable to our daily lifestyle and production activities.

Recently, with efforts to limit global warming and reduce CO₂ emissions in order to realize a sustainable environment, there is a strong awareness of the urgent challenges presented by energy and environmental issues. At the July 2008 Hokkaido Toyako Summit, a proposal was made to cut global CO₂ emissions by 2050 to half the present amounts. According to the Japanese Ministry of the Environment, CO₂ emissions from factories and such in the industrial sector in 2007 were 1.3% less than in 1990, however emissions from offices and such in the business sector increased by 41.7% and emissions in the household sector increased by 41.1%. Under these circumstances, an amended "Law concerning the Rational Use of Energy" (Energy-saving Law) was announced on May 30, 2008 and is slated to be enforced on April 1, 2009. With this amendment, the energy management obligation of large factories greater than a certain size will instead become mandatory for each company (including franchise chains). Also, with the goal of reaching the Kyoto protocol targets and achieving further dissemination of these targets, a subsidy program for the cost of installing consumer-use photovoltaic power generation equipment, which had temporarily been suspended, will resume accepting applications as of January 2009.

Responding to major trends such as energy and environmental issues, Fuji Electric intends to use applied power electronics technology in response to expectations concerning these market demands.

As a leader in the power electronics sector, Fuji Electric has been providing power semiconductor devices, which is an important power electronics device, since the mid-1970s, and has provided products applied power electronics technology for various market sectors. When we integrated our businesses in July 2008, applied products were concentrated in Fuji Electric Systems Co., Ltd. and reorganized as our drive business, and we transformed from being a business with an awareness of conventional products to a business structure that provides solutions from customers' perspectives and provides products and systems that fulfill

a wider range of society's needs.

For example, IDCs (Internet Data Centers) have expanded as the quantity of digital information has increased, but the accompanying increase in their electric power consumption has caused a noticeable problem. At an IDC, IT devices account for approximately 30% of the power consumption, while the majority of electric power is used for cooling, air venting, power supply equipment and the like. A green IDC concept, which promotes total power savings, is under consideration and efficiency improvements are sought for the entire system rather than for individual devices.

On the other hand, continuous economic growth on a worldwide scale is essential. With economic development, however, people and objects tend to move about with increased frequency, and consequently, demand for transportation infrastructure improvements will increase, especially in the BRIC nations. As a result of the recent global financial crisis, the world economy might decline temporarily. For an economic counter measure to it, railway transportation is being reconsidered as an eco-friendly transportation means and aggressive investment is planned, with investment in the transportation infrastructure being expected to rebound soon. A transportation system that limits CO₂ emissions during mass transit via railroads and ships, and to contribute to energy and environmental issues, is desired to be proposed as a benign to the global environmental and is highly efficient measure to the global environment.

Leveraging the Fuji Electric group synergy, proposals for this kind of green IDC concept and the highly efficient transportation system concept are being considered as proposals for a total system.

Moreover, for the individual devices required for solution proposals, we plan to implement further improvements in power electronics applied technology, to manufacture from a global perspective and to improve the service environment in order to provide optimal products and services for overseas countries as well.

Businesses contributing to protection of the global environment by providing, with an energy saving system utilizing a limited amount of energy efficiently as much as possible, a new electric drive system and a system utilizing natural energy such as solar power and wind power to the maximum extent as an economical efficiency could allow instead of fossil fuels are expected to expand continuously.

This special edition describes some of Fuji Electric's efforts involving drive and power source technology.

In response to public and market needs, Fuji Electric intends to make a positive contribution continuously to assisting to the global environment protection and support from the readers of this journal earnestly.



* All brand names and product names in this journal might be trademarks or registered trademarks of their respective companies.