Keynote speaker

Mr. Masayuki TOBITA, Vice President of Power Electronics Systems Division, TMEIC, Japan

Title

Carbon Neutrality Accelerated by Power Electronics

Abstract

In Glasgow last year, in COP26, countries discussed on the global goal, achieving Carbon Neutrality by 2050. For the conference, IPCC issued the 6th report and suggested that the global warming continued with rather high rate. IEA reported the state of CO_2 emission and suggested that present policies were insufficient for achieving Carbon Neutrality. IEA especially suggested accelerating energy transition by 2030, a milestone to 2050. In addition to those suggestions, the recent geopolitical issue forced countries to focus on energy security and to accelerate renewables.

TMEIC continues to develop power electronics technology under the concept of "PEiE", Power Electronics in Everything. This speech introduces that power electronics is a key technology essential for accelerating energy transition and for achieving Carbon Neutrality.

For accelerating the energy transition, renewables and energy storages play major roles to form the future electric power networks. There, the digital networks will manage the dynamic balancing among generation, energy storage, and consumption. In the fields such like transportation, steel, or synthetic chemistry, Green Hydrogen is expected to accelerate the transition as clean fuel or clean raw material.

For the energy transition, the power electronics technology contributes to various fields. It works in power conversion of renewables and of energy storages. It also contributes to long distance power transmission from remote renewables. For producing Green Hydrogen, the power electronics supplies high DC current to electrolyzers. For industries, the power electronics improves energy efficiency in the motor drive systems. The power electronics supports electrifications by supplying high-frequency power or DC power to induction heating or to arc furnaces, respectively. For managing the future energy network, the IC, information/communication, networks are essential. The power electronics supports the IC networks by feeding stable power.

In summary, the power electronics contribute to form the infrastructures of future clean energy networks in every sector. The power electronics is greatly expected as one of key technologies to accelerate energy transition to Carbon Neutrality.