

Development of High Temperature Type Fuel Cells

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Chubu Electric Power Co, Inc. is advancing the research and development of Molten Carbonate Fuel Cells (MCFC) and Solid Oxide Fuel Cells (SOFC), high-temperature fuel cells which have the potential for high efficiency power generation and are promising as future power generation systems.

The MCFC can use coal gasification gas and waste gasification gas as fuel, in addition to natural gas. We are conducting a study of a unit combining an MCFC and waste gasification system. There are two methods for gasification of waste products: converting flammable waste such as wood and plastic into gas at high temperatures, or performing methane fermentation of organic waste such as food waste. Regarding the former method, a 300kW class MCFC system and a high-temperature wood chip gasification furnace (processing amount: 3.5t/day) have been installed at Chubu Electric's Shin-Nagoya Thermal Power Plant, and demonstrated operation of the combined system is planned for 2005. As for the latter method, a verification test of the operation of a 300kW class MCFC system using methane gas, obtained from on-site food waste, as fuel is planned for the 2005 World Exposition, Aichi, Japan.

As for the SOFC, the development of a Mono-block Layer Built (MOLB) SOFC has been in progress since 1992, in cooperation with Mitsubishi Heavy Industries, Ltd. The development of a practical application system began in 2002 and, presently, a 50kW class cogeneration system is under development. The verification test of the 50kW class SOFC system is planned for the 2005 World Exposition, Aichi, Japan.