

Resolving Power Issues

Renewable energy is one of society's greatest needs of the century. Universiti Kebangsaan Malaysia's (UKM) Fuel Cell Institute researcher Dr Mostafa Ghasemi said he and other scientists were experimenting with various low-cost material alternatives for the components of a microbial fuel cell. A microbial fuel cell (MFC) or biological fuel cell is a device that converts chemical energy to electrical energy by the catalytic reaction of microorganisms such as bacteria and algae. A typical MFC consists of anode and cathode compartments separated by a cation (positively charged ion) specific membrane. Dr Ghasemi explained that the features of a MFC make it suitable for simultaneous wastewater treatment and energy production.

Microbes that exist naturally in the sewage will produce electrons as they metabolise or digest organic material in the sludge. When the electrons are transferred to the cathode compartment of the fuel cell, they generate the current and voltage to make electricity. Therefore, wastewater is treated while at the same time, electricity is generated for use as a power source. However, the important components required for a combined water treatment and power generation plant are still quite expensive and the engineering issues such as low current density and low power must first be resolved before a viable large-capacity facility can be operational. 90% of the cost of a MFC is due to the cathode catalyst and Proton Exchange Membrane used in the fuel cell. Platinum is the best material for the cathode and it can last for about six years in the MFC.

(Sourced from The Star, 10 March 2013)