

# PRODUCTION OF BIOELECTRICITY FROM wastewater AND WASTE BIOMASSES WITH MICROBIAL FUEL CELLS

**Innovations and Benefits** - The production of biological electricity from wastewater and organic waste materials normally requires the production of a fuel (biogas) which is then used in a cogenerator.

With the developed process the electric energy is directly collected through two electrodes placed in contact with the microbial flora, fed by the nutrients present in the wastewater, without having to go through a combustion process.

Every single cell is able to develop a voltage equivalent to that of a normal fuel cell with the same conversion efficiency.

**Use** - Microbial Fuel Cells are biological fuel cells, where the fuel is supplied directly by the bacteria used to degrade the organic substances. With the energy produced it is possible to operate different types of electrical equipment, including lighting systems and household appliances.

The MFC can be used not only to produce electricity but also to selectively remove specific pollutants in the feed wastewater.

**Applications and ongoing Activities** - The Microbial Fuel Cell has been tested in the laboratory using different substrates for energy production. Energy production was equal to expectations. Currently studies are underway to improve performance and redesign the process in order to reduce losses due to electrical resistances, even without the use of proton exchange membranes.



Microbial fuel cell membraneless with management and control device (Patent B02006A879)

