

COMMUNITY MATTERS

FUEL CELL



With the current debates over energy, more people are aware of the benefits and potential applications of fuel cells. The principle of the fuel cell was discovered by German scientist Christian Friedrich Schönbein in 1838. Fuel cells produce energy without combustion by an electrochemical process using hydrogen fuel. A fuel cell consists of two electrodes sandwiched around an electrolyte. Oxygen (from the air) enters the fuel cell through the cathode. Encouraged by a catalyst, the hydrogen atom splits into a proton and an electron, which take different paths to the cathode. The proton passes through the electrolyte. The electrons create a separate current that can be utilized before they are reunited with the hydrogen and oxygen to form water molecules.

A fuel cell system which includes a "fuel reformer" can utilize the hydrogen from any hydrocarbon fuel including natural gas, methanol, biomass, and gasoline. Fuel cell types are characterized by their electrolytes and temperature of operation. Fuel cells are divided into five main groups: PEM, or proton exchange membrane fuel cells, phosphoric acid fuel cells, molten carbonate fuel cells, solid oxide fuel cells and alkaline fuel cells. There are several applications of fuel cells such as fuel cell vehicle, personal devices (laptops, cell phones, hearing aids) and stationary power production. Because fuel cells do not have moving parts and do not rely on combustion, they are easy to maintain, very efficient, and quiet.

