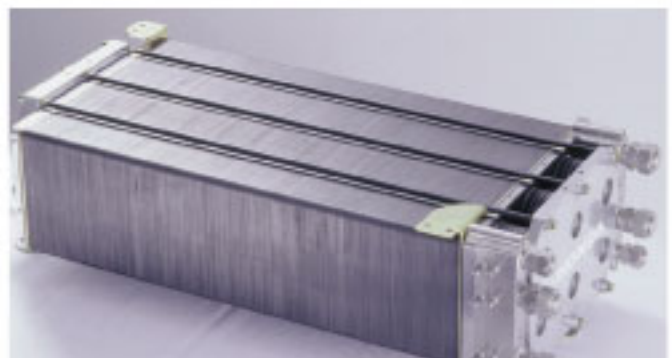


# UNDERSTANDING Fuel Cells



Above: Honda's FCX is powered by a fuel cell (top and top right).

A fuel cell is an energy conversion device that converts hydrogen and oxygen into electricity and heat. It is very much like a battery that can be recharged while you are drawing power from it. Instead of recharging using electricity, however, a fuel cell uses hydrogen and oxygen.

A fuel cell provides electricity that can be used to power motors, lights or any number of electrical appliances. There are several different types of fuel cells, each using a different chemistry. Some types of fuel cells show promise for use in power generation plants. Others are more suited to small portable applications or for powering cars.

The proton exchange membrane fuel cell (PEMFC) is one of the most promising technologies. This is the type of fuel cell that will end up powering cars, buses and maybe even your house. A single fuel cell produces a little less than one volt, so to produce enough voltage to power a car or a house, many separate fuel cells must be combined to form a fuel-cell stack.

PEMFCs operate at a relatively low temperature (about 80 degrees), which means they warm up quickly and don't require expensive housings. Constant improvements in engineering and materials in these cells have increased the power density to a level where a device about the size of a small piece of luggage can power a car.

The oxygen required for a fuel cell comes from the air but hydrogen is not so readily available. For instance, you don't have a hydrogen pipeline coming to your house and you can't pull up to a hydrogen pump at your local petrol station – yet.

Pollution reduction is one of the primary goals of the fuel cell – using hydrogen as a fuel means the only emission is water.

Several manufacturers have said they will have fuel cell vehicles for sale in 2005.

