



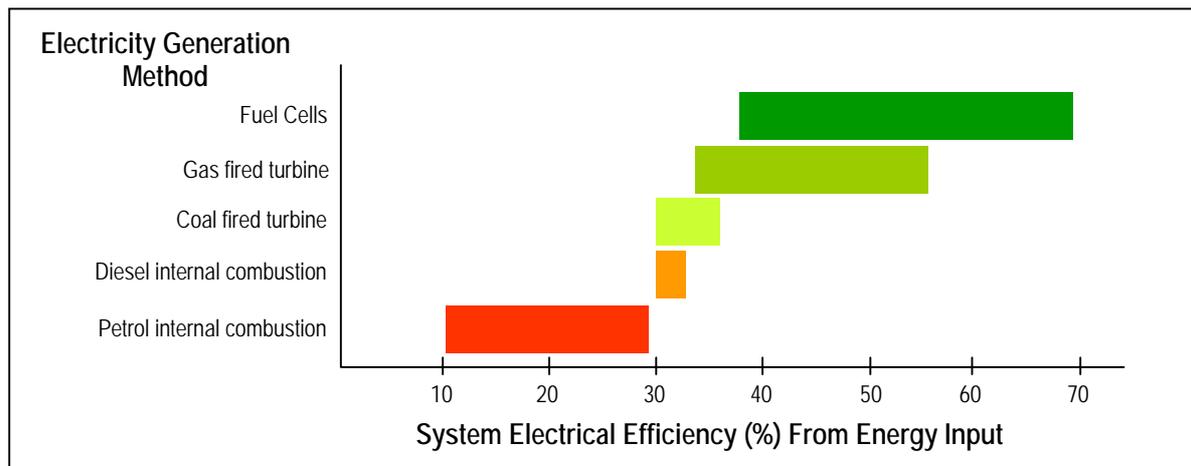
### What is a Fuel Cell?

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A fuel cell is a device that very efficiently generates Direct Current (DC) electricity from hydrogen rich fuels through an electrochemical reaction.

A fuel cell is *similar* to a battery in that it provides continuous DC electricity from a chemical reaction. Again, *similar* to a battery, a fuel cell has an anode, a cathode and an electrolyte. However, unlike batteries, fuel cells cannot store electrical energy, do not 'run flat', or require electricity to charge them again. Fuel cells can continuously generate electricity so long as they have a supply of fuel and air. The correct terminology for describing an operational fuel cell is actually a fuel cell system, as a fuel cell requires a range of other systems to function properly.

Unlike other electricity generators such as internal combustion engines or coal/gas powered turbines, fuel cells do not burn fuel. This means there are no noisy high-pressure rotors or loud exhaust noise and no vibration. Fuel cells produce electricity through a silent electrochemical reaction. Another feature of fuel cells is that they convert the chemical energy in the fuel directly into electricity, heat and water.



The term electrical efficiency describes how much input fuel energy is converted into output electrical energy. Naturally, system efficiencies vary from manufacturer to manufacturer and with the size of the installation.

Because fuel cells are very efficient and in the process do not burn the fuel through combustion, fuel cells **do not** produce large quantities of greenhouse gases such as Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>) and Nitrogen Oxide (NO<sub>x</sub>). The only emissions from fuel cells are water in the form of steam and low levels of Carbon Dioxide (none if the fuel cell uses pure hydrogen as a fuel).

A fuel cell requires sophisticated operating systems – often called 'balance of plant' - to function properly. Ceramic Fuel Cells Limited (CFCL) designs and manufactures fuel cells as well as complete fuel cell systems. CFCL products have the potential to generate electricity much more efficiently and much cleaner than traditional fossil fuel based combustion technologies.