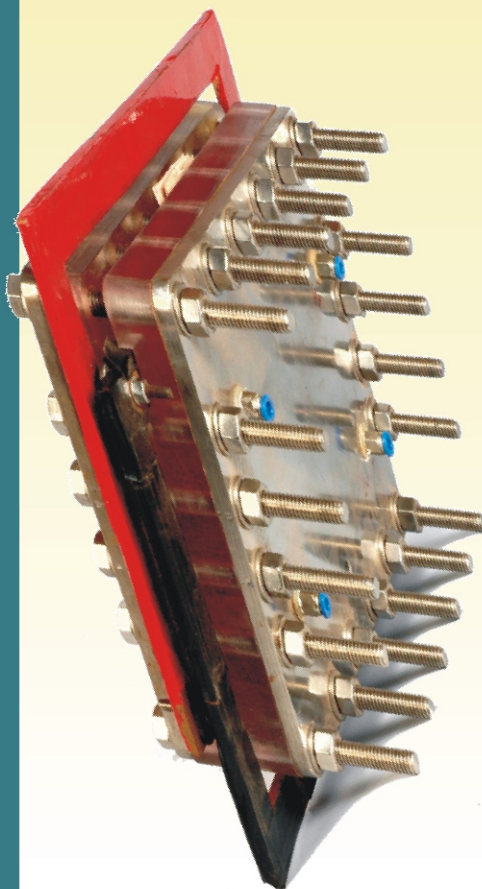


Hydrogen Generation



PEM-BASED HYDROGEN GENERATOR



It is estimated that earth receives about 126 trillion horsepower, i.e. 96 billion kilowatts from the sun constantly. If this colossal and unlimited energy could be more fully utilized, our dependence on fast dwindling fossil fuel will be drastically reduced.

CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE
Karaikudi - 630 006, INDIA

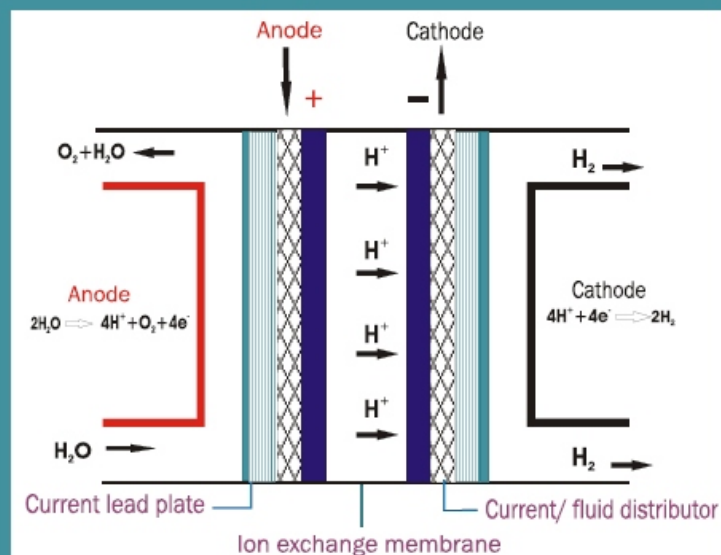


Fig.1. Schematic Diagram of PEM Water Electrolyser

Central Electrochemical Research Institute (CECRI), Karaikudi has an ongoing Research and Development activity on Hydrogen based Fuel Cells under NMITLI programme of CSIR, New Delhi. Polymer Electrolyte Fuel Cell (PEFC) stacks developed at CECRI desire pure hydrogen as fuel for their longevity. Accordingly, CECRI has initiated Research & Development activity on Polymer Electrolyte Membrane (PEM) based hydrogen generator to generate pure hydrogen and oxygen from water (see Fig. 1) to feed the gaseous reactants to the anode and cathode compartments of PEFC. The ultimate goal is to integrate the Solar photovoltaic panels to the hydrogen generator and run PEFC by feeding with gaseous hydrogen and oxygen reactants (See Fig. 2).

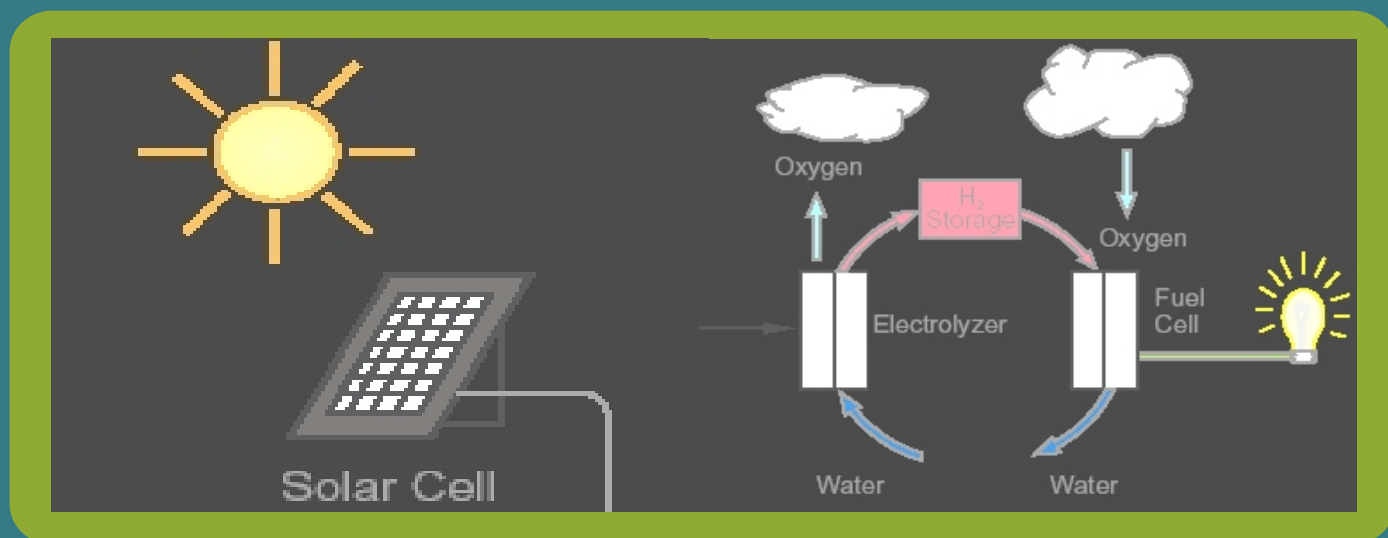


Fig. 2. Regenerative Fuel Cell

Beginning with the development of 100W PEM-based hydrogen generator, CECRI has developed a 5kW PEM-based hydrogen generator that has the capacity to generate 1Nm^3 of hydrogen per hour (see Fig. 3). The technical specification of the PEM-based hydrogen generator is as follows.

Description	5kW
Cell Active Area, dm^2	5.0
No. of cells	5
Current density, $\text{A}.\text{dm}^{-2}$	100
Maximum Current, A	500
Cell voltage, V	2.3
H_2 gas, m^3/h	1.0
O_2 gas, m^3/h	0.5
H_2 purity, % by volume	99.995
O_2 purity, % by volume	> 99%
Energy Consumption, kWh/Nm^3	5.75



100 W Hydrogen Generator



400W Hydrogen Generator

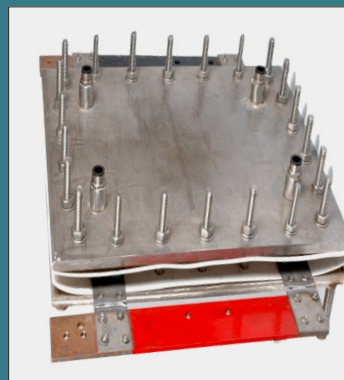
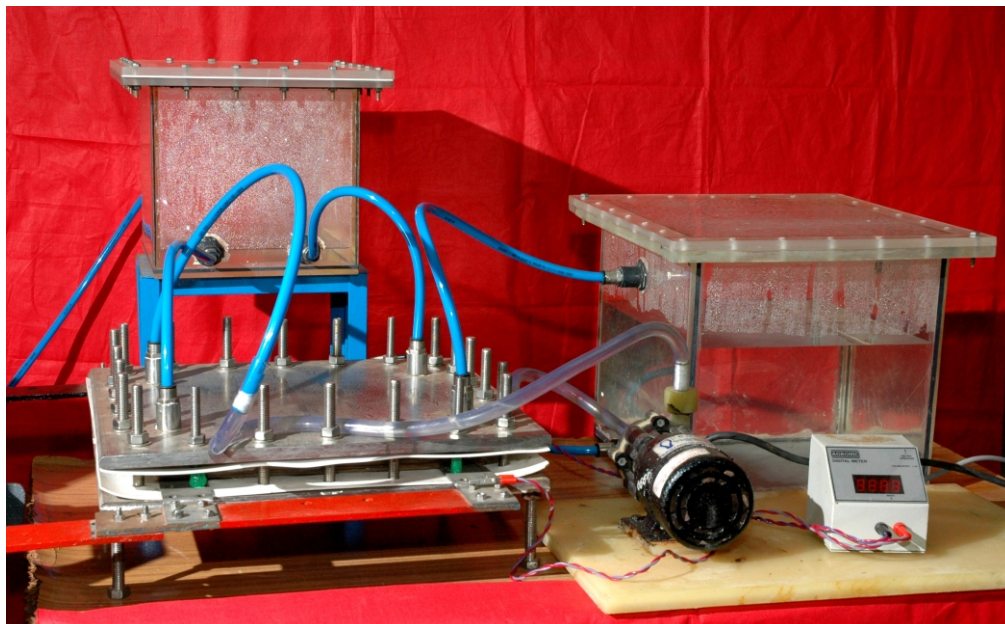


Fig. 3. 5kW Hydrogen Generator

Development of PEM-based Hydrogen Generators at CECRI, Karaikudi



5kW Hydrogen Generator



For further details

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