



Hospitals

Fuel Cells and Hospital Applications

Hospitals require constant power 24/7 for operating and emergency rooms, vital machines and instruments, computers, refrigeration for medicine, food, and blood, not to mention heating and cooling. Any disruption could mean more than just loss of electricity, but loss of life and precious medical resources and research.

In states where hospitals are required to have at least 24 hours of backup power, many rely on diesel generators usually placed on the roof. Even with regular testing and maintenance, these generators have a spotty track record of providing emergency backup power. During the 2003 blackout, half of the 58 metropolitan hospitals in New York had failures in their backup power generators.

Fuel cells are increasingly being considered by hospitals for both primary and backup power needs.

"With fuel cells on each campus, it allows for a reliable power source on-site. In addition, the high efficiency of the power plants is a way to save energy while promoting a healthy environment."

– Robert J. Falaguerra, Saint Francis Hospital's vice president of facilities, support services and construction

Benefits

Fuel cells generate electricity using an electrochemical reaction, not combustion, and when pure hydrogen is used, there are no polluting emissions, only water and heat as by-products.

Fuel cells can provide primary power, backup power, or combined heat and power (CHP), and since they can be installed as part of the electric grid, or in parallel to it, fuel cells can provide reliable power without disruption due to grid failure or blackouts. The excess heat can be captured to provide hot water or space heating, and when installed as CHP systems, the fuel cells are achieving 85% efficiency and higher.

Current Fuel Cell Customers

- **Chino Valley Medical Center** (California) – 600 kW fuel cell system reduces the facility's carbon footprint by 22%.
- **Hartford Hospital** (Connecticut) – 1.4 MW fuel cell supplies about 60% of the hospital's power and most of the facility's heat requirements. Excess heat is harnessed and utilized by a nearby school system.
- **Sutter Santa Rosa Hospital** (California) – new facility, operates a 375 kW fuel cell system to generate about 70% of the hospital's electricity needs.
- **St. Francis Hospital** (Connecticut) – two sites in Hartford run on 400-kW fuel cells, saving the hospital \$10,000 in electricity costs annually.
- **St. Helena's Hospital** (California) – a 400 kW fuel cell, installed in 2009, supplies electricity, hot water, and space heating for three of the hospital's buildings in Napa Valley.
- **Stamford Hospital** (Connecticut) – operates a 4.8 MW fuel cell system.
- **University of California, Irvine, Medical Center** (California) – planning a 1.4 MW fuel cell system.
- **Waterbury Hospital** (Connecticut) – installed a 2.4 MW fuel cell system.

This market is also extending into healthcare administrators, medical device suppliers and biotechnology companies.

Kaiser Permanente has 4.3 MW currently installed in California, at seven sites. The company claims that its fuel cells, combined with on-site solar installations, helped reduce its GHG by more than 17,700 metric tons in 2013. Other customers in this market sector include Becton Dickinson (BD), Life Technologies (1-MW installations at both its Pleasanton and Carlsbad, California, campuses), and Medtronics, using reliable fuel cells to protect valuable inventory and priceless scientific research in its laboratories and large freezers and refrigerators.