

Airports

Fuel Cells and Airport Applications

Airports have a large impact on the surrounding environment, consuming tremendous amounts of fuel and emitting large amounts of particulate matter, nitrogen oxides, volatile organic compounds, noise and light pollution, all of which reduce air quality and affect human health. Aside from the airplanes themselves, aircraft nose wheels, baggage movers, maintenance and security vehicles, and passenger shuttles all contribute to airport energy consumption and emissions.

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 cell technologies are scalable and flexible, allowing for application throughout the airport, for any size power need. Fuel cells can provide stationary power, motive power, and auxiliary/backup power and can also be used as onboard battery chargers. Fuel cells can power a variety of services and logistics at an airport, including:



Fuel cell tow tractor

- **Ground Support Needs** – Ground support equipment includes baggage movers, meal-service trucks, maintenance vehicles, forklifts, passenger shuttles, snow plows, and nose wheels. Fuel cells can also be installed as an auxiliary power unit on larger vehicles, including airplanes, to power electronics. Hydrogen stations could be deployed throughout the airport grounds to support multiple vehicles.
- **Communications Networks and Computer Systems** – Control towers, reservation desks, security services, communications systems, weather monitoring, air traffic control sites, closed-circuit video cameras, logistics centers, emergency response, buildings, guard gates, and other critical functions are all potential fuel cell applications.
- **Other Applications:** Other airport power needs that fuel cells can address include runway lighting, automatic walkways, retail, restaurants, airport amenities, and more.

Benefits

A fuel cell that operates using hydrogen fuel generates power without any on-site greenhouse gas (GHG) or other polluting emissions. Fuel cells are virtually silent, reducing noise emissions as well. They are also extremely reliable and can be configured to operate independent of the electric grid, and many times have a longer run time than batteries or diesel generators.

Current Demonstrations / Deployments

- **Memphis International Airport** – As part of a DOE-funded two-year trial, FedEx Express is operating 10 fuel cell-powered baggage tow tractors at Memphis Airport.
- **Los Angeles International Airport** – A portable hydrogen station that opened in 2004 is being upgraded to a permanent station.
- **Kansai International Airport** – The Japanese Airport Authority announced in February 2015 it would begin replacing its fleet of 400 forklifts with ones powered by fuel cells.