Stationary Fuel Cell Market Opportunities, Strategies, and Forecasts, 2006 to 2012

Industrialization Requires Sustainable, Highly Efficient Energy. Stationary fuel cell company analysis indicates that markets targeted, cost targets, and power ratings have enormous similarity between companies. Generally the target cost is $300 per Kilowatt and the current cost is $4,500 per Kilowatt.

Economies of scale and new materials are needed to bring the units within target costs. With the cost of crude oil climbing toward $100 per barrel, it really does not matter what the cost of the fuel cell is, people need to start buying and using them. They provide energy independence off grid, cogeneration of heat, air conditioning, and electricity, and operate in a manner that is more environmentally appropriate.

NETL anticipates eventual mass-production of fuel cells from solid ceramic materials, dramatically reducing costs. Trial installations have moved to provide incentive to invest in the stationary fuel cell market as it begins to mature.

Industrialization requires sustainable, highly efficient energy. Fossil fuel generation needs to be replaced by clean, renewable energy. Fuel cells run on hydrogen that in turn needs to be manufactured. Hydrogen can be manufactured from nuclear, wind, and solar power. Nuclear power run at 100% capacity can be used to generate hydrogen with the unused electricity. Stationary fuel cells promise to use that energy stored as hydrogen.

For homeowners seeking true electrical grid independence, SOFC micro-power plants take away the dependence and limitations of the electric distribution grid, in a remote standalone package that can also provide heat for the home. This lets the homeowner live just about anywhere, in the mountains or deep woods, in the desert or on an island. Fuel cells run on hydrogen that in turn needs to be manufactured. Hydrogen can be manufactured from wastewater treatment plants, landfill gasses, nuclear, wind, and solar power. Stationary fuel cells promise to use that temporary energy stored as hydrogen.

Because hydrogen can be manufactured from landfill and wastewater treatment plants, many units are being located close to those energy sources. Giving fuel for stationary campus fuel cell units is a priority. Nuclear energy is also used to generate hydrogen from its excess capacity. The reactors in the world used for nuclear electricity generation in 2005 created 2,626 billion kilowatts of energy.

Stationary fuel cells are being implemented as cogeneration units that produce electricity and heat. They can also be used as air conditioners. United Technologies PureComfort™ systems consist of four, five or six 60kW microturbines and a doubleeffect absorption chiller / heater from United Technologies sister company Carrier Corporation, a global leader in building heating, cooling, and control networks. These systems can reach efficiencies up to 90 percent and are operating in a wide variety of commercial buildings.

The UTC Power PureCell™ 200 has operated in 19 countries, delivering clean, highly efficient power to end users. Clean and energy-efficient, the PureCell™ 200 is a combined heat and power unit that produces 200kW of electricity and up to 925,000 BTU/hr of heat. With the capacity to operate grid-connected or grid-independent, it transitions power instantaneously with no interruption in service.

The system meets the strictest emission standards and operates quietly on site. Globally, UTC Power has installed more than 275 PureCell™ 200 units with more than 1 billion kilowatt hours of operating time. The PureCell™ 200 has an overall efficiency of 90 percent in combined heat and power mode, compared with 30 percent for the electric grid. Because power is generated onsite, transmission losses are avoided.

As the dollars per kilowatt for stationary fuel cell utility units decline to $4,500 in 2009, markets start to pick up with grid utility power company units shipped.

The stationary fuel cell markets at $98 million have been at stasis for several years, due to the high cost per kilowatt that is not competitive with existing utility technology. As the price of fuel rises, environmental concerns become more compelling, and demand for reliability more intense, the markets become more mature.

This is because the demand picks up for reliable units that can run on hydrogen from excess electricity generated by wind power. Solar power begins to be a factor as well, with nanotechnology breakthroughs giving solar photovoltaic power a cost competitive position in the energy chain. Fuel cells are needed to level out the power distribution. Wind power is plentiful in the ocean, and can be used to generate electricity there, that can be transmitted to reforming stations where the electricity is stored as hydrogen for use in stationary fuel cells used by utility companies.

2-megawatt fuel cell power plants demonstrate the feasibility of fuel cell research. Monitoring and down time to replace parts are issues. More work needs to be done to reduce the costs and develop a better catalyst to drive machines. Research is concentrated on making units smaller and easier to use.

Source: Mindbranch