

Direct Methanol Fuel Cells (DMFC): Extends Power Efficiency for Portable Electronic Devices -- Markets Reach \$1.1 Billion By 2016

LEXINGTON, Massachusetts (October 22, 2010) – WinterGreen Research announces that it has a new study on Direct Methanol Fuel Cell (DMFC) Market Strategy, Market Shares, and Market Forecasts. The 2010 study has 279 pages, 66 tables and figures. Worldwide markets are poised to achieve significant growth as a new generation of portable electronics has need for longer power on times. DMFC is positioned to provide longer power on times with rapid refill of charging liquid. Units are expected to reach cost parity with thin film batteries by the end of the forecast period. Demand for more portable electricity is coming with the increased use of broadband cell phones, laptop computers, and tablet PCs.

According to Susan Eustis, the lead author of the study, “the use of DMFC is a breakthrough for portable energy delivery. Throughout the forecast period DMFC miniature fuel cells are expected to be able to enable consumers to talk for up to a month continuously on a cellular phone without recharging.” Fuel cells change the telecommuting world, powering laptops and digital handheld devices. Personal digital devices work for hours. DMFCs run longer than batteries. The fuel is abundant and available.

The single largest direct-methanol fuel cell (DMFCs) market driving force is that devices can be used in airplanes. Approvals came after safety standards were in place. The International Civil Aviation Organization and the US Department of Transportation have allowed methanol fuel cells and their cartridges to be carried in the passenger cabin of airplanes.

This means air travels will start to buy them. The convenience and the longer life for power is a compelling advantage. To keep an executive, manager, or service person working while traveling provides an increase in productivity. Software engineers can work more productively while commuting.



Copyright 2008 WinterGreen Research, Inc.

-Page 1-

WinterGreen Research, Inc.

6 Raymond St.

Lexington, MA 02421

(781) 863-5078

www.wintergreenresearch.com

DMFC is a subset of the proton exchange membrane (PEM) fuel cell technology. The direct methanol fuel cell or DMFC is emerging as a significant energy source for some cell phone and laptop applications. DMFC emergence is viable in the portable device sector. Commercialization is driven by consumer demands and desires for a power source that can operate alone or as a supplement synergistically with existing advanced battery technologies.

DMFC technology is used to power consumer-portable devices. Applications are achieved through continuing research and innovation. Micro fuel cells are being developed. These are showing efficiency rates close to 40 percent.

Methanol is the type of material used in the fuel cell stack to generate the chemical reaction (electrolyte) needed to make electricity. DMFC fuel cells emit fewer pollutants than other forms of energy generation, they have the potential to use 50 % less energy than internal combustion engines and 30 % less energy than conventional gas-fired power plants.

Nanotechnology improves fuel cells. Nanotechnology is used for making fuel cell catalysts. Catalysts are used with fuels such as hydrogen or methanol to produce hydrogen ions. Platinum, which is very expensive, is the catalyst typically used in this process. Companies are using nanoparticles of platinum to reduce the amount of platinum needed, or using nanoparticles of other materials to replace platinum entirely and thereby lower costs.

Nanotechnology is providing significant breakthroughs in catalysts that provide improvements in capability. Through extensive catalyst development and use of superior membrane materials, QuantumSphere has developed MEA technology that allows the direct methanol fuel cell to operate with up to 10X higher methanol fuel concentrations, without a sacrifice in power, which can directly lead to as much as a ten times reduction in size and weight of the fuel tank.



Copyright 2008 WinterGreen Research, Inc.

QSI's catalyst solution uses lower cost metals, engineered at the nano scale, to replace platinum. Palladium is one example, as it resembles platinum chemically, is extracted from copper-nickel ore, and is already used as a catalyst material in the catalytic converters of automobiles. Palladium is also about 70% less expensive than platinum, and when used at the nano scale in direct methanol fuel cells, it has demonstrated an increased power density of 45%.

Fuel cells run on methanol, an inexpensive alcohol used in windshield wiper fluid. This DMFC market has as the earliest adapters users of laptop computers, particularly for the military. These users are dependent on mobile electronics.

Electronics needs to operate in the field for long times and needs rapid recharging. Military applications, enhanced cell phones and other hand held devices lead adoption of DMFCs into the consumer markets.

Small portable devices are well suited, in terms of storage, safety, and energy density, to use of methanol as a fuel for fuel cells. Direct hydrogen feed for fuel cells requires complicated storage and would take much more space in small portable devices. There is also the safety issue of compressed hydrogen being allowed on airplanes. Cartridges of methanol can fit into existing retail channels or be available from OEMs. Methanol cartridges could be available through any number of delivery channels and accepted without difficulty into the consumer market.

Direct Methanol Fuel Cell (DMFC) market forecasts indicate markets at \$65.6 million in 2009 are anticipated to reach \$1.1 billion by 2016. DMFC will account for 85% of the portable fuel cell market by the end of the forecast period.



Copyright 2008 WinterGreen Research, Inc.

WinterGreen Research is an independent research organization funded by the sale of market research studies all over the world and by the implementation of ROI models that are used to calculate the total cost of ownership of equipment, services, and software. The company has 35 distributors worldwide, including Thompson Financial.

Contact:

Susan Eustis, President and Co-Author
WinterGreen Research
6 Raymond St.
Lexington, MA 02421

(781) 863-5078 (Work)
(617) 852-7876 (Cell)
susan@wintergreenresearch.com
www.wintergreenresearch.com

Keywords: DMFC, Nanotechnology Catalysts, Direct Methanol Fuel Cell, DMFC Cellphone Charging, DMFC Peripheral Charging , DMFC Catalysts, Laptops, Misc. Gadgets, Samsung Military Fuel Cell , DMFC Fuel Cell Prototypes, Methanol-Powered Dock , Power A Laptop For A Month, DMFC (Direct Methanol Fuel Cell, Activated Carbon, NaOH, Chemical Activation, Pore size Distribution, DirectMethanolFuelCell, DMFC Portable Power, Laptop Fuel Cell, Cell Phone Fuel Cell, Broadband Fuel Cell, FuelCell, DMFC Portable Power, , Nanotechnology in Fuel Cells , DMFC Proves More Reliable Than Liquid Hydrogen Fuel Cells, Portable Power Applications of DMFC, Active And Passive DMFC, www.wintergreenresearch.com, <http://wintergreenresearch.com/reports/DMFC.htm>, Direct Methanol Fuel Cell DMFC Market Forecasts

