

Nanotechnology:

Micro Generation Of Energy Stored in Thin Film Batteries

World Energy Market Shifts, Forecasts, and Strategies, 2007-2013

A Study of Micro Energy Generators, Thin Film Batteries, and Campus Fuel Cells in the Electrical Grid, Non-grid Applications, and the Transportation Industry

Nanotechnology is providing us next generation systems that rely on micro-generation of energy stored in thin film batteries. Nanotechnology works on both sides of the equation. Solar and wind generators are made more efficient by the use of nanoparticles in the drive and collector mechanisms. Thin film batteries use new materials created using nanotechnology to achieve components that are used to manufacture batteries 40 times more efficient than current batteries.

World energy market shifts are a result of these new renewable energy and storage technologies. Wind and solar energy can be generated and stored as DC current in residential settings. Wind and solar power can be stored by using thin film batteries that in turn are used to power electronics, LED lights, and small appliances in the home. Systems work using a direct current (DC) power system that supplements the power coming off the grid into the home.

Wind and solar generators operating in residential settings store energy in thin film batteries for use in autos. Wind and solar power stored in thin film batteries can be used to power cars by hooking the car battery to the home battery with a wire and a plug at each end of the wire. This assumes that there are lots and lots of solar panels, small windmills like would be used on a boat, and thin film batteries. The billions of units needed create economies of scale and bring prices of these products well below the \$100 per unit price.

Wind power and solar power are anticipated to be long-term energy sources for thin film batteries used to run cars and to provide a DC power connection in the home. Campus based stationary fuel cells, depend on landfill and wastewater treatment plants to provide gas for providing energy to manufacture hydrogen.

Micro-generation of energy is set to bring a worldwide economic revolution brought by the availability of thin film batteries that are more fuel-efficient, charge within minutes, and hold a charge 40 times longer than existing batteries. Thin film batteries can be charged from renewable energy sources and used to power the home and car.

Micro generators include wind and solar have not been as efficient as buying electricity from the grid. Micro generation has developed independently of a grid connected house, office, or factory on boats and away from civilization. Now that technology is ready for mainstream use. Once the micro wind turbine has been purchased energy is free, and now it can be stored efficiently, which was never possible before. So there are very good reasons to install micro generation.

The dramatic shift to renewable energy sources is illustrated in the new world energy study from WinterGreen Research that describes how renewable energy systems provide economies of scale and power automobiles from energy generated from wind and solar panels and stored in thin film batteries.

Valence Technology Thin Film Auto Battery



Charging systems can be developed that permit plugging into a thin film battery located at home or work

World Energy Analysis WinterGreen Research



Solar

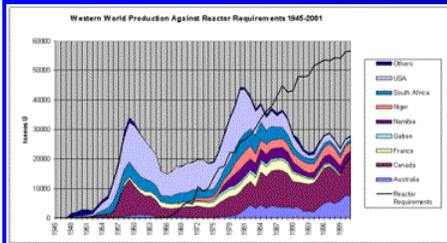
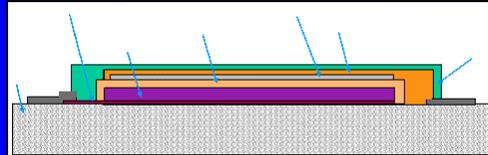
Thin
 Film
 Battery



Wind



Nuclear



Stationary
 Fuel
 Cell



World Energy Study Market Shifts: Wind and Solar Micro Generation Of Energy Stored in Thin Film Batteries

- By: Susan Eustis
- President WinterGreen Research
- Research in communications and computer markets and applications.
- Holds several patents in micro-computing, voting, and parallel processing.
- Author of 300 market research studies of telecommunication, computer, software, security, and energy.
- ROI Tool To Access Mainframes

- By: Dr. Susie Eustis
- PhD Georgia Tech
- Physical Chemistry
- Specialty in Gold Nanotechnology
- Research Positions Held Include
- Ph. D. research with Dr. Mostafa A. El-Sayed 2002-2006, focused on photochemistry, and optical properties of gold and silver nanoparticles
- Ph. D. research with Dr. L.A. Lyon 2000-2002, focused on assembly of soft colloidal nanoparticles
- Papers include "Why gold nanoparticles are more precious than gold"



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