

Thin Film Battery -- Markets Reach \$3.6 Billion By 2017

LEXINGTON, Massachusetts (October 5, 2011) – WinterGreen Research announces that it has a new study on Thin Film and Printed Battery Market Shares and Forecasts, Worldwide, Nanotechnology 2011-2017. These products power sensors that are the base for smarter computing. The 2011 study has 505 pages, 164 tables and figures. Thin film batteries are evolving solid state technology that provides vast improvements in energy density and creates units that can be recharged 40,000 times, up from 200 times for traditional batteries.

Thin film battery market driving forces include business inflection that is achieved by delivering smart computing technology that supports entirely new capabilities. Sensor networks are creating demand for thin film solid state devices. Vendors doubled revenue and almost tripled production volume from first quarter. Multiple customers are moving into production with innovative products after successful trials.

A strong business pipeline has emerged with customer activity in all target markets. Vendors expect full-year revenue to more than double in 2011. The market focus is shifting from ramping capacity to driving manufacturing efficiencies and achieving margin improvement, indicating increasing market maturity.

Smarter computing depends on instrumented devices. Key factors that increase the demand for these thin film batteries is the flexibility these batteries offer in terms of size and shape. Roll-to-roll production technology, a process of manufacturing battery cell on a roll of flexible plastic material or a metal foil, enables low cost and high volume manufacturing.

Megatrends include consumer demand for increased portability, smart cities that demand connectivity and, tracking all through the city, and human demand for environmentally friendly products. These megatrends are driving the demand for these batteries. Widespread usage of smart cards in diverse applications is another factor creating demand for these batteries. Smartcards powered through thin film batteries enable better contact from a smart card to the common database, retaining the dimensions of the card.



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-Page 1-

WinterGreen Research, Inc.

6 Raymond St.

Lexington, MA 02421

(781) 863-5078

www.wintergreenresearch.com

Software is needed to create systems that manage smarter computing and instrumented systems. SOA provides the base for cloud computing and for smarter computing. IBM is the market leader in SOA.

IBM is the leader in SOA markets with 78% share in 2010. No other vendor has above 4% market share and software vendors are merging and making acquisitions at a rapid pace seeking to achieve credible SOA product sets. IBM software is the defacto standard in this industry. The market is evolving rapidly.

One of the remarkable aspects of the IBM SOA solution is that it permits users to work across software segments to achieve significant insight into their IT automated process. Thus, while most software fits into a neat category of software, business process management (BPM), information management, data base, applications, application server, system management, SOA embraces a large number of categories to provide a solution. The IBM SOA solution is robust because it supports so many different aspects of integration across platforms.

With WebSphere MQ as a base, the IBM SOA solution is able to transport messages once and only once, in a mission critical manner, across disparate platforms and across multiple layers of application, creating an integration stack that is unique.

Cloud and virtualization from IBM leverage the smarter computing using the WebSphere product set that leverage sensors used to implement smarter computing. These sensors need thin film batteries to function remotely. In a smarter computing dynamic business climate, organizations are challenged with managing an ever-growing amount of business applications, often requiring extremely sophisticated processing capabilities. The thin film batteries are used to support gathering information from instrumented sensors in large networks.

Every big automaker, battery maker, national lab and university materials-science department in the world has a team of PhDs whose lives consist of testing countless combinations of elements in an effort to build a better battery. There is a fundamental challenge to evolve solid state batteries.



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-Page 2-

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6 Raymond St.

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Solid state batteries need more work to become a large market. Fabrication methods do not yet scale to large format batteries. This is because the cost of vacuum deposition has been prohibitive. Researchers are working to develop an alternative deposition process. It has the ability to make nanostructured electrolyte and electrode materials with chemistries.

A low temperature deposition process for thin film batteries enables use of flexible, polymer foil as the substrate. This technology largely reduces the production cost of the thin film batteries. Successful development of a low temperature manufacturing process (<350°C) opens up the possibility of using a polymer substrate such as Kapton, thereby significantly reducing manufacturing cost, while gaining flexibility and significantly reducing the overall thickness of the cells.

Thin film battery high power & energy density, specific power & energy are issues. A comparison of battery performance for various rechargeable batteries is a compelling illustration of the value of thin film batteries. Data for thin film batteries using very thin substrates illustrate the longer cycle life that can be achieved.

Improved energy density is a significant factor to be considered in development of thin film battery materials. Thin film lithium batteries have the potential to reach an energy density as high as 1000 Wh/l. Cell phones and laptops using these thin film batteries will be capable of running up to four times longer than on other lithium ion batteries having the same physical size.

Lithium-ion categories: are cobalt, manganese, iron-phosphate, polymer and nickel manganese-cobalt. These are the main types of commercialized battery in China. It remains to be seen how thin film batteries utilize these or other materials.

The worldwide demand for energy is steadily increasing, doubling every 15 years. The major effort is to sustain growth in the electricity supply without causing irreversible harm to the environment. Solar energy has rapidly grown as a clean, renewable alternative to limited fossil fuels. Recognition of the need to reduce reliance on coal and fossil fuels is driving interest in solar energy.



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The need to reduce reliance on coal and fossil fuels is intuitive. The science agrees -- climate change is a reality. Citizens want to do something about climate change. Countries wish to not have dependence on foreign suppliers.

According to Susan Eustis, lead author of the study, “thin film solid state batteries bring smaller, more energy efficient batteries for use in virtually every portable device and every industry. Products will be used in all areas of the world.” When thin film solid state batteries are looked at with respect to ROI and TCO, the units pay for themselves because of increased energy efficiency and support for many times more recharges, providing a longer lifetime for units. Batteries provide very attractive payback.

The global market for thin-film and printed batteries at \$182.5 million in 2010 is expected to reach \$3.6 billion by 2017. This market is expected to increase because it enables smarter computing and there is tremendous momentum for this in the market now. System design is accelerating the value of cloud smarter buildings, roads, appliances, and bridges. All these need sensors and all those need tiny batteries•

The total solid state batter market is anticipated to reach \$ 20 billion sometime in 2023.

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 Global Information Info Shop, Market Research.com, Research and Markets, Bloomberg, and 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



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-Page 4-

Keywords: Thin Film Battery, Thin Film Solid State, Solid State Battery, Printed Battery, Sensor Battery, Smarter Computing, Cloud Computing, Security, Integrated Supply Chain, Smart SOA, Polymer Film Substrate, Flexible Thin Battery, Smarter Computing, Intelligent Systems, Cloud, Virtualization, Nanotechnology, Polymer Film Substrate, Printed Electronics, Remote Sensors, Smart Card Battery, RFID and Small Thin Film, Battery-Assisted Passive and Active RFID, Medical Batteries, Nanoparticles, Electrochromics, Solid State Energy Storage, Energy Harvesting, Rechargeable EnerChips, SRAM Backup, Manganese Dioxide Nanotechnology, Radio Tags, Organic Radical Battery (ORB), Polymer Film Substrate, Lithium Air Battery, Battery Anode, Battery Cathode, Thin Film Battery Timescales, http://wintergreenresearch.com/reports/thin_film_battery.html



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-Page 5-

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