WINTERGREEN RESEARCH, INC.

Worldwide Nanotechnology Thin Film Lithium-Ion Battery Market Shares, Strategies, and Forecasts, 2009-2015

Lithium-Ion Batteries Provide Increased Energy Density

Picture by Susie Eustis

MOUNTAINS OF OPPORTUNITY

WinterGreen Research, Inc.
Lexington, Massachusetts **www.wintergreenresearch.com**

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WinterGreen Research announces that it has a new study on Worldwide nanotechnology thin film lithium-ion battery markets. The 2009 study has 412 pages, 112 Tables and Figures. Worldwide Nanotechnology lithium-ion batteries are poised to achieve significant growth as units become smaller and less expensive broadening the types of energy applications in which they are included.

Worldwide nanotechnology thin film lithium-ion batteries are poised to achieve significant growth as units become more able to achieve deliver of power to electric vehicles efficiently. Less expensive lithium-ion batteries allow leveraging economies of scale and proliferation of devices into a wide range of applications. According to Susan Eustis, lead author of the study, "Economies of scale leverage the lithium-ion battery nanotechnology advances needed to make lithium-ion batteries competitive. Nanotechnology provided by lithium-ion research solves the issues poised by the need to store renewable energy. Lithium-ion batteries switch price reductions are poised to drive market adoption by making units affordable."

Nanotechnology results obtained in the laboratory are being translated into commercial products. The processes of translating the nanotechnology science into thin film lithium ion batteries are anticipated to be ongoing. The breakthroughs of science in the laboratory have only begun to be translated into life outside the lab, with a long way to go in improving the functioning of the lithium-ion batteries. Unlike any other battery technology, thin film solid-state batteries show very high cycle life. Using very thin cathodes (0.05µm) batteries have been cycled in excess of 45,000 cycles with very limited loss in capacity. After 45,000 cycles, 95% of the original capacity remained.

Then there is the problem of translating the evolving technology into manufacturing process. What this means is that the market will be very dynamic, with the market leaders continuously being challenged by innovators, large and small that develop more cost efficient units. Systems integration and manufacturing capabilities have developed a broad family of high-power lithium-ion batteries and battery systems. A family of battery products, combined with strategic partner relationships in the transportation, electric grid services and portable power markets, position vendors to address these markets for lithium-ion batteries.

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Electric Vehicles depend on design, development, manufacture, and support of advanced, rechargeable lithium-ion batteries. Batteries provide a combination of power, safety and life. Next-generation energy storage solutions are evolving as commercially available batteries. Lithium-ion batteries will play an increasingly important role in facilitating a shift toward cleaner forms of energy.

Innovative approaches to materials science and battery engineering are available from a large number of very significant companies -- GE, Panasonic Sanyo / Matsushita Industrial Co., Ltd., NEC, Saft, Toshiba, BYD / Berkshire Hathaway, LG Chem, Altair Nanotechnologies, Samsung, Sony, A123 Systems with MIT technology, and Altair Nanotechnologies.

Markets for lithium-ion batteries at $911 million in 2008 are anticipated to reach $9.1 billion by 2015, growing in response to decreases in unit costs and increases. Lithium-ion batteries used in cell phones and PCs, and in cordless power tools are proving the technology. Units are shipped into military markets and are used in satellites, proving the feasibility of systems. Small, lithium-ion prismatic batteries prove the feasibility of this technology. The large emerging markets are for hybrid and electric vehicles powered by renewable energy systems.

Companies Profiled

Market Leaders

Saft
Panasonic / Sanyo

A123 Systems
BYD
EnerDel
NEC
Nissan
Boston Power

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Market Participants

Advanced Cerametrics
Altair Nanotechnologies
Applied Data
Bekaert
Robert Bosch GmbH
Boston Power / Sonata
BYD / Berkshire Hathaway
Cymbet
Dow
E-One Moli Energy Group
Ener1
Excellatron
Exon
ExxonMobil Chemical / Tonen Chemical Corporation
Front Edge Technology (FET)
GE
GM
Ignite
IPS
Johnson Controls-Saft
KSW Microtec
LG Petrochemical
LG Chem
MMT Funds
NEC
Nissan Motor Co.,
NEC TOKIN Joint-Venture Company –
Automotive Energy Supply Corporation (AESC) -
Oak Ridge Micro-Energy
QuantumSphere
Saft
Johnson Controls-Saft
United States Advanced Battery Consortium (USABC)
Samsung
Solicore
Think
Valence
Ulvac

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REPORT METHODOLOGY

THIS IS THE 399TH REPORT IN A SERIES OF MARKET RESEARCH REPORTS THAT PROVIDE FORECASTS IN COMMUNICATIONS, TELECOMMUNICATIONS, THE INTERNET, COMPUTER, SOFTWARE, TELEPHONE EQUIPMENT, HEALTH EQUIPMENT, AND ENERGY. THE PROJECT LEADERS TAKE DIRECT RESPONSIBILITY FOR WRITING AND PREPARING EACH REPORT. THEY HAVE SIGNIFICANT EXPERIENCE PREPARING INDUSTRY STUDIES. FORECASTS ARE BASED ON PRIMARY RESEARCH AND PROPRIETARY DATA BASES. FORECASTS REFLECT ANALYSIS OF THE MARKET TRENDS IN THE SEGMENT AND RELATED SEGMENTS. UNIT AND DOLLAR SHIPMENTS ARE ANALYZED THROUGH CONSIDERATION OF DOLLAR VOLUME OF EACH MARKET PARTICIPANT IN THE SEGMENT. INSTALLED BASE ANALYSIS AND UNIT ANALYSIS IS BASED ON INTERVIEWS AND AN INFORMATION SEARCH. MARKET SHARE ANALYSIS INCLUDES CONVERSATIONS WITH KEY CUSTOMERS OF PRODUCTS, INDUSTRY SEGMENT LEADERS, MARKETING DIRECTORS, DISTRIBUTORS, LEADING MARKET PARTICIPANTS, OPINION LEADERS, AND COMPANIES SEEKING TO DEVELOP MEASURABLE MARKET SHARE. OVER 200 IN DEPTH INTERVIEWS ARE CONDUCTED FOR EACH REPORT WITH A BROAD RANGE OF KEY PARTICIPANTS AND INDUSTRY LEADERS IN THE MARKET SEGMENT. WE ESTABLISH ACCURATE MARKET FORECASTS BASED ON ECONOMIC AND MARKET CONDITIONS AS A BASE. USE INPUT/OUTPUT RATIOS, FLOW CHARTS, AND OTHER ECONOMIC METHODS TO QUANTIFY DATA. USE IN-HOUSE ANALYSTS WHO MEET STRINGENT QUALITY STANDARDS. INTERVIEWING KEY INDUSTRY PARTICIPANTS, EXPERTS AND END-USERS IS A CENTRAL PART OF THE STUDY. OUR RESEARCH INCLUDES ACCESS TO LARGE PROPRIETARY DATABASES. LITERATURE SEARCH INCLUDES ANALYSIS OF TRADE PUBLICATIONS, GOVERNMENT REPORTS, AND CORPORATE LITERATURE.

YOU MUST HAVE THIS STUDY

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ABOUT THE COMPANY

WINTERGREEN RESEARCH, HAS A MULTIFACETED PRIMARY RESEARCH STRATEGY FOR IDENTIFYING MARKET TRENDS THROUGH READING AND INTERVIEWING OPINION LEADERS. BY READING, INTERVIEWING OPINION LEADERS, AND ACCESSING MARKET TRENDS WINTERGREEN RESEARCH SENIOR ANALYSTS ADDRESS RESEARCH. THE VALUE PROPOSITION FOR COMPETITIVE ANALYSIS COMES FROM RICH AND DIVERSE SOURCES OF INPUT.

IT IS THE DUTY OF THE SENIOR ANALYSTS TO LOOK AT MASSIVE AMOUNTS OF CONTENT, AND THEN TO MAKE SENSE OF THAT CONTENT. THE ABILITY TO THINK ABOUT MARKET TRENDS IS ENHANCED BY DOING IT OVER AND OVER FOR MANY DIFFERENT MARKETS. THAT IS WHAT WINTERGREEN RESEARCH IS ALL ABOUT: READING AND THINKING IS AN ESSENTIAL ASPECT OF COMPETITIVE ANALYSIS. TALKING TO OPINION LEADERS IS THE THIRD ESSENTIAL ASPECT OF PRODUCING GOOD, RELIABLE DATA.

WINTERGREEN RESEARCH, FOUNDED IN 1985, PROVIDES STRATEGIC MARKET ASSESSMENTS IN TELECOMMUNICATIONS, COMMUNICATIONS EQUIPMENT, HEALTH CARE, INTERNET AND ADVANCED COMPUTER TECHNOLOGY. INDUSTRY REPORTS FOCUS ON OPPORTUNITIES THAT EXPAND EXISTING MARKETS OR DEVELOP MAJOR NEW MARKETS. THE REPORTS ASSESS NEW PRODUCT AND SERVICE POSITIONING STRATEGIES, NEW AND EVOLVING TECHNOLOGIES, AND TECHNOLOGICAL IMPACT ON PRODUCTS, SERVICES, AND MARKETS. MARKET SHARES ARE PROVIDED. LEADING MARKET PARTICIPANTS ARE PROFILED, AND THEIR MARKETING STRATEGIES, ACQUISITIONS, AND STRATEGIC ALLIANCES ARE DISCUSSED. THE PRINCIPALS OF WINTERGREEN RESEARCH HAVE BEEN INVOLVED IN ANALYSIS AND FORECASTING OF INTERNATIONAL BUSINESS OPPORTUNITIES IN TELECOMMUNICATIONS AND ADVANCED COMPUTER TECHNOLOGY MARKETS FOR OVER 30 YEARS.

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ABOUT THE PRINCIPAL AUTHORS

ELLEN T. CURTISS, TECHNICAL DIRECTOR, CO-FOUNDER OF WINTERGREEN RESEARCH, CONDUCTS STRATEGIC AND MARKET ASSESSMENTS IN TECHNOLOGY-BASED INDUSTRIES. PREVIOUSLY SHE WAS A MEMBER OF THE STAFF OF ARTHUR D. LITTLE, INC., FOR 23 YEARS, MOST RECENTLY AS VICE PRESIDENT OF ARTHUR D. LITTLE DECISION RESOURCES, SPECIALIZING IN STRATEGIC PLANNING AND MARKET DEVELOPMENT SERVICES. SHE IS A GRADUATE OF BOSTON UNIVERSITY AND THE PROGRAM FOR MANAGEMENT DEVELOPMENT AT HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. SHE IS THE AUTHOR OF RECENT STUDIES ON WORLDWIDE TELECOMMUNICATIONS MARKETS, THE TOP TEN INTERNET EQUIPMENT COMPANIES, THE TOP TEN CONTRACT MANUFACTURING COMPANIES, AND THE TOP TEN TELECOMMUNICATIONS MARKET ANALYSIS AND FORECASTS.

SUSAN EUSTIS, PRESIDENT, CO-FOUNDER OF WINTERGREEN RESEARCH, HAS DONE RESEARCH IN COMMUNICATIONS AND COMPUTER MARKETS AND APPLICATIONS. SHE HOLDS SEVERAL PATENTS IN MICROCOMPUTING AND PARALLEL PROCESSING. SHE HAS THE ORIGINAL PATENTS IN ELECTRONIC VOTING MACHINES. SHE HAS NEW PATENT APPLICATIONS IN FORMAT VARYING, MULITPROCESSING, AND ELECTRONIC VOTING. SHE IS THE AUTHOR OF RECENT STUDIES OF THE SERVICES ORIENTED ARCHITECTURE, CONTENT MANAGEMENT, MID SIZE BUSINESS MIDDLEWARE, REGIONAL BELL OPERATING COMPANIES' MARKETING STRATEGIES, INTERNET EQUIPMENT, BIOMETRICS, A STUDY OF INTERNET EQUIPMENT, WORLDWIDE TELECOMMUNICATIONS EQUIPMENT, TOP TEN TELECOMMUNICATIONS, DIGITAL LOOP CARRIER, WEB HOSTING, WEB SERVICES, AND APPLICATION INTEGRATION MARKETS. MS. EUSTIS IS A GRADUATE OF BARNARD COLLEGE.

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