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Worldwide Nanotechnology Electric Vehicle (EV) Market Shares, Strategies, and Forecasts, 2009 to 2015

Electric Vehicle Markets Set to Grow Rapidly

Picture by Susie Eustis

MOUNTAINS OF OPPORTUNITY

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

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Breakthrough technology in electric vehicles brings advancements that provide customers with personal transportation choices never before available.

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Electric vehicles are real. They come in a variety of styles and capabilities. The BMW features driving control and style. The Chinese BYD hybrid backed by Warren Buffet's company has features that enable plug-in hybrid power train flexibility. It has a full battery-powered electric mode. The series-hybrid mode has an engine which drives a generator to recharge the batteries, acting as a range-extender. There is a parallel hybrid mode, in which the engine and motor both provide propulsive power.

Electric vehicles represent a quantum shift in transportation. The design trajectories are varied; the opportunities are significant as a quantum shift occurs in what the vehicle basic functions are and how the vehicle works. The car companies that leverage the market opportunity to shift to a new paradyne are likely to succeed. There are others who merely try to migrate existing styles and designs to electric vehicles. Buggy whips come to mind.

The ability to plug a car into a hardened backyard set of batteries charged from a solar panel provides relief from gasoline spending. To have a second car, powered by a battery pack promises to provide growth of a new industry. The banks can loan against the car and the solar panel. Solar panels are evolving modular capability where they can be quickly installed and provide electricity for the car.

Investment in electric vehicle infrastructure is a priority. With countries seeking to invest in infrastructure that will provide economic growth, it is clear that special infrastructure for electric vehicles will stimulate growth from the private sector. Electric vehicle market segment is positioned for growth for vehicles used for local driving.

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.

Markets for electric vehicles at 685 units in 2008 are anticipated to reach 32.7 million autos shipped by 2015, growing in response to demand for a renewable energy powered vehicle that lowers the total cost of ownership by a significant amount. Lithium-ion batteries used in cell phones and PCs, and in cordless power tools are proving the technology to power electric vehicles. Early electric vehicles are being used as city cars, proving the feasibility of electric cars. Think in Norway has a viable manufacturing operation and 1,000 cars on the road. The large emerging markets are for hybrid and electric vehicles powered by renewable energy systems.

Electric Vehicle (EV) Companies Profiled

Electric Vehicle (EV) Market Leaders

Tesla Motors
Daimler AG
Think
General Motors
BMW
BYD / MidAmerican Energy Holdings
Miles XS500 Electric Car
Mitsubishi i MiEV Electric Car
NEC / Fuji Heavy Industries / Subaru
NEC / Nissan
REVA Electric Car
Zenn Low Speed Electric Car
Ford
Shelby Supercars

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Electric Vehicle (EV) Market Participants

Electric Vehicle Company Profiles
A123 Systems
Aperta
Better Place Model
E-One Moli Energy Group
Ener1 / Enertech
EnerDel Operations
LG Petrochemical
Panasonic / Sanyo
Saft
Samsung
Electric Supercar by Hybrid Technologies
Electric Mini by PML
Commuter Cars Tango Electric Car
Eliica Electric Car by KEIO University
Wrightspeed X1 Electric Car
Toyota Hybrid Prius
Chrysler
Phoenix
Aptera

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REPORT METHODOLOGY

THIS IS THE 403RD 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.

FINDINGS AND CONCLUSIONS OF THIS REPORT ARE BASED ON INFORMATION GATHERED FROM INDUSTRY SOURCES, INCLUDING MANUFACTURERS, DISTRIBUTORS, PARTNERS, OPINION LEADERS, AND USERS. INTERVIEW DATA WAS COMBINED WITH INFORMATION GATHERED THROUGH AN EXTENSIVE REVIEW OF INTERNET AND PRINTED SOURCES SUCH AS TRADE PUBLICATIONS, TRADE ASSOCIATIONS, COMPANY LITERATURE, AND ONLINE DATABASES. THE PROJECTIONS CONTAINED IN THIS REPORT ARE CHECKED FROM TOP DOWN AND BOTTOM UP ANALYSIS TO BE SURE THERE IS CONGRUENCE FROM THAT PERSPECTIVE.

THE BASE YEAR FOR ANALYSIS AND PROJECTION IS 2008. WITH 2008 AND SEVERAL YEARS PRIOR TO THAT AS A BASELINE, MARKET PROJECTIONS WERE DEVELOPED FOR 2009 THROUGH 2015. THESE PROJECTIONS ARE BASED ON A COMBINATION OF A CONSENSUS AMONG THE PRIMARY CONTACTS COMBINED WITH UNDERSTANDING OF THE KEY MARKET DRIVERS AND THEIR IMPACT FROM A HISTORICAL AND ANALYTICAL PERSPECTIVE. THE ANALYTICAL METHODOLOGIES USED TO GENERATE THE MARKET ESTIMATES ARE BASED ON PENETRATION ANALYSES, SIMILAR MARKET ANALYSES, AND DELTA CALCULATIONS TO SUPPLEMENT INDEPENDENT AND DEPENDENT VARIABLE ANALYSIS.

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ABOUT THE COMPANY

WINTERGREEN RESEARCH, RESEARCH STRATEGY IDENTIFIES MARKET TRENDS THROUGH READING MARKET MATERIALS AND INTERVIEWING OPINION LEADERS. WINTERGREEN RESEARCH TEAM WORKS TO GATHER PRIMARY INFORMATION FROM COMPANY INTERVIEWS, INDUSTRY MATERIALS, AND COMPANY DOCUMENTS TO WRITE MARKET RESEARCH STUDIES FROM AN INDEPENDENT PERSPECTIVE. 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 AN ESSENTIAL ASPECT OF PRODUCING GOOD, RELIABLE, INDEPENDENT DATA.

BY READING THE ELECTRONIC EQUIVALENT OF 40 FEET OF PAPER, WINTERGREEN RESEARCH SENIOR ANALYSTS CAN LEARN A LOT MORE ABOUT MARKETS. IDENTIFICATION OF MARKET TRENDS IS A HIGH PRIORITY AT WINTERGREEN RESEARCH. AS WITH THE VALUE PROPOSITION FOR COMPETITIVE ANALYSIS COMING FROM GETTING PRIMARY INPUT FROM A RANGE OF INDUSTRY PARTICIPANTS AND OBSERVERS.

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.

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, worldwide energy markets, solar utility markets, solar technology markets, thin film battery markets, webcam markets, 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, nanotechnology, and application integration markets. Ms. Eustis is a graduate of barnard college.

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