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Worldwide Nanotechnology Electric Smart Grid Market Shares Strategies, and Forecasts, 2009 to 2015

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Abstracts

WinterGreen Research announces that it has a new study on Worldwide nanotechnology electric smart grid markets. Worldwide the smart electric grid is poised to achieve significant growth as end to end transmission and distribution management is implemented. Systems integration, management of consumer endpoints, the ability to recharge cars from renewable energy stations, the ability to store solar power is anticipated to drive smart grid market growth.

The smart grid depends on automated process provided by software. Middleware provides the integration technology to support inter-connective grid systems in a flexible manner.

Smart grid middleware software market share analysis relates to looking at how existing utility market presence is shifting to smart grid systems. Middleware is useful for managing the ability to turn appliances on and off remotely. It is useful for controlling the distribution of renewable energy. IBM dominates the SOA Web services markets because of its broad set of software and hardware product lines in combination with a strong global services team.

The new management challenges of service-orientation relate to establishing governance in the context of changing market conditions. SOA provides flexibility—breaking ungainly monolithic applications into distributed components and enabling IT to nimbly respond to the needs of the business. Organizations harness the potential of service orientation to create a sustainable competitive advantage.

IBM is the leader in SOA smart grid electric utility markets with 54% share of a $169 million market. Tibco is the number two vendor with 32% market share. SOA software

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vendors are merging and making acquisitions at a rapid pace seeking to achieve SOA product sets that are relevant to the shifting smart grid systems. IBM approach to the smart grid is to partner with suppliers so that leveraging information provides a more intelligent marketing effort by a team of suppliers.

Cisco EnergyWise permits companies to reduce energy costs and greenhouse gas. Endpoints are most impacted by the smart grid. Power management is being automated so that devices can be turned on and off to achieve storage of electricity from renewable sources. Day-to-day use of electricity is being taken to a new level of IT control.

Power electronics are at the heart of the interface among energy storage, distributed generation and the electric system. Power electronics devices hold substantial promise for transforming the electric power system. High voltage power electronics allow precise and rapid switching of electric power to support long distance transmission. Lower voltage power electronics can be used in power distribution, and in the interface between customers and the electric grid.

The smart electrical grid is moving to electronics and sensors from a purely mechanical infrastructure. Computer networks and systems are needed to gather and analyze information. With information comes the ability to intelligently control the grid. Solid state electronics provides the base for gathering information from the electricity grid. Control is needed because renewable energy brings several different types of electricity to be transmitted and distributed.

Solid state electronics is set to improve the efficiency of the electricity grid. Solid state electronics is used for compression connectors and cross arms. Solid state fault-current limiters using high temperature superconductors offer a solution to controlling fault-current levels on utility distribution and transmission networks. These fault-current limiters, unlike reactors or high-impedance transformers, limit fault currents without adding impedance to the circuit during normal operation. Development of superconducting fault-current limiters is being pursued by electrical manufacturers around the world.

Breakthrough technology in electric grids brings advancements that provide customers with personal transportation choices never before available. Transmission capacity to bring remote generation to load centers is limited. New transmission infrastructure is being planned and built to address this issue. Increasingly, new generation is sited far from population centers. Wind power generation is often located in remote or rural locations. This requires the installation of new transmission. Wind resources have

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capacity factors below 50%. It is often the case that new transmission capacity for the renewable resource is not economical.

This leads to the incentive for use of end point storage of power generated from renewable sources. Local generation of electricity from wind and solar do not require the development of new transmission lines. The local generators are not necessarily owned by a utility, more likely by the building owner or residence owner. Thus, the utilities do not plan for the effectiveness of local generation of electricity because they do not profit from it.

Wind power projects may mean it is cost-effective to build transmission capacity for slightly less than the full nameplate capacity of the project and store output during the small number of hours per year when output exceeds the available transmission capacity. Adding energy storage to enable the dispatch of the energy at a different time is being developed.

According to Susan Eustis, lead author of the study, “Large emerging smart grid markets are providing equipment used for electricity management of new renewable energy gat endpoints. Systems are used to consolidate and distribute power generated by renewable energy systems. Endpoints are being configured with batteries. End to end management of electricity by the smart grid means that appliances, air conditioners, and electric vehicles have an ability to manage stored energy. End point management of electricity from off peak times for use during peak hours requires a more sophisticated electrical grid.”

Markets for electric smart grid SOA and software integration infrastructure at $169 million in 2008 are anticipated to reach $1.7 billion by 2015. Markets for electric smart grid meters at $492 million in 2008 are anticipated to reach $1.1 billion by 2015. Lithium-ion batteries used in cell phones and PCs, and in cordless power tools are proving the technology to power endpoint of electric grids. Early trials of electric smart grid meters are being used, proving the feasibility of electric smart grids.

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