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Energy Harvesting Market Shares, Strategies, and Forecasts, Worldwide, Nanotechnology, 2012 to 2018

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Abstracts

WinterGreen Research announces that it has a new study on Energy Harvesting Market Shares and Forecasts, Worldwide, Nanotechnology 2012-2018. Products power sensors that are the base for smarter computing. The 2011 study has 625 pages, 209 tables and figures. Energy harvesting devices are evolving in the context of the development of solid state technology that provides vast improvements. Improvements in energy density are one of the benefits of energy harvesting give to traditional rechargeable and solid state batteries.

Advanced technologies associated are emerging that make energy harvesting feasible. Advanced storage devices are emerging simultaneously. Storage devices can leverage the power captured by energy harvesting devices. Energy storage technologies of super-capacitors and thin-film batteries have become cost-effective. Energy harvesting devices have attained workable levels of efficiency. There are significant cost reductions. Many applications are related to smarter computing that depends on sensors capturing change in conditions and making adjustments to the environment based on measured change.

Existing energy harvesting and storage applications include vibration-based wireless train measuring systems, wireless sensors distributed city wide to implement smart cities, oil field monitoring systems, windup laptops for use in remote regions, and wireless light switches for use in smart buildings. Wireless sensors are self-powering. They can be used to alert and monitor a range of environments and incidents, pollution and forest fires, robberies in a city, temperature in a building, and movement around a border fence.

Energy harvesting technologies include electrodynamics, photovoltaics, piezoelectrics,

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and thermovoltaics. Photovoltaic systems for solar energy is mostly outside the scope of this study. The energy harvesting and energy storage market factors light harvesting for small devices.

Technological developments in the fields of low-power electronics and energy storage systems have allowed energy harvesting to become an increasingly viable technology. It is alternatively referred to as energy scavenging and power harvesting. Energy harvesting technology has become sophisticated and efficient.

Energy harvesting is the use of ambient energy to provide electricity for small electronics, for sensor networks, and for mobile equipment. It is able to provide maintenance free, long life energy for equipment, reducing the need for batteries. Units are used to recharge solid state batteries that can handle as many as 40,000 recharges. Energy harvesting provides the ability to connect with existing devices. Energy harvesting is used when wires or batteries are too expensive to be practical.

Energy harvesting depends on the capture of ambient energy, its conversion to usable form, and storage. Common examples of energy harvesting include wristwatches powered by body movement and bicycle dynamo powered by the motion of the wheel.

Integrated circuits can perform algorithmic control and achieve wireless communications using tiny amounts of energy. These integrated circuits provide a technological tipping point that permits the evolution of energy-harvesting-based systems from niche products, to widespread use in wireless networks.

According to Susan Eustis, the senior analyst for the study, 'The wireless sensor node is the most important product type forecast for growth as an energy-harvesting solution. Wireless sensors are ubiquitous and very attractive products to implement smarter planet initiatives using harvested energy.'

Wireless sensors nodes are commonly placed in hard-to-reach locations. Changing batteries can be costly and inconvenient. Wireless sensors using harvested energy provide off-the-shelf availability of ultra-low-power, single-chip wireless microcontrollers (MCUs) capable of running control algorithms and transmitting data using sophisticated power management techniques.

Energy harvesting markets at $511 million a year market worldwide in 2011 is anticipated to increase tenfold to $5.1 billion by 2018. This strong growth is anticipated to come as units are less expensive and more effective in the same amount of space.

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Wireless sensor networks are useful almost everywhere, creating the opportunity to implement controls and mange every aspect of human activity in ways that have not even been imagined hitherto.

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.

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