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Quantum Dot Market Shares, Strategies, and Forecasts, Worldwide, 2015-2021

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Abstracts

WinterGreen Research announces that it has published a new study Quantum Dots: Market Shares, Strategy, and Forecasts, Worldwide, 2015 to 2021. The 2015 study has 448 pages, 183 tables and figures. Worldwide quantum dot markets are poised to achieve significant growth as next generation systems provide a way to improve traditional displays with vibrant color and decrease the cost of making electronic devices by decreasing manufacturing costs while increasing quality.

Quantum dot markets are set for rapid growth. Quantum dot market driving forces relate to technology maturity. TV displays, fuel cell catalysts, solar quantum dots, a range of applications depend on the ability to manufacture quantum dots consistently and in sufficient quantity to be useful in a commercial environment. Large screen TV displays represent one of the first commercial application for quantum dots.

This TV display market is a good market. The overall flat panel display (FPD) market is anticipated to reach US$110 Billion by 2017. Growth is driven by widespread use of devices that embed electronic displays. Displays fit in electronic TVs, notebooks, and mobile smart phones. Ample opportunities exist in the automotive sector as display mediums for entertainment and driver assistance systems.

FPDs can tap into opportunities in the advertising sector, where they are used for both outdoor and indoor ad displays. Public display systems are becoming more common. Technology innovation, lower prices, and robust demand bodes well for market development.

Quantum dot films inside FPDs are indispensable to electronic devices that require human operation and as a result LCD and plasma technologies are now commonplace.

In the television industry. Quantum dot penetration of flat panel display markets promise to be huge. Demand for thin TVs is strong, with wall mounted TVs accounting for a major portion of the market. FPDs are popular for buildings and transport applications. They are used in digital picture frames.

Challenges to existing display technology comes from viewer desire for pure colors and low energy consumption. These features are provided by quantum dots. End-use of big TV displays are expected to drive quantum dot markets throughout the forecast period. Industries analyzed include information systems, personal computers, telecom equipment, instrumentation, consumer appliances, transportation equipment, stationary fuels cells, and medical devices.

Quantum Dot (QD) and Quantum Dot LED (QLED) Market is evolving. The quantum dot market depends on techniques for the development of commercial quantity production. Kilogram quantity mass production of quantum dots is a game-changer. High quality, high quantity and low price quantum dots increase the rate of change in consumer electronics markets.

Quantum dot technology offers screen quality far beyond what has been available previously. The quality of light is better for displays with quantum dots. New products are emerging as manufacturers learn to integrate high efficiency / luminescence quantum dots into display products. The level of change represents a paradigm shift that creates new industries, products, and jobs in science and industry. The list of possible quantum dot applications is ever expanding. New applications are waiting for the availability of quantum dots.

Gold Nanoparticles Illustrate Properties Of Colloidal Nanocrystals Size Dependency

Intrinsic physical sizes are comparable to the critical sizes of many important properties of a given class of functional materials

Wavelength of the electron wave function

Diameter of photo-generated excitons

Domain size of magnetic single domains

Large surface-to-volume atom ratio alters the chemical potential of the structural

Large surface-to-volume atom ratio different in comparison to corresponding bulk crystals

Strongly size-dependent solubility of nanocrystals

Presence of size dependent structures in the nanometer regime

Electron band configuration

Surface structure

Surface reconstruction

Unique crystal structures

Unique catalytic properties of gold nanocrystals can be considered an example

Quantum Dot and Quantum Dot LED (QLED) market segments include HDTV and displays, solar, LED lighting, cancer imaging, personalized medicine, telco lasers, and ID tags. All segments are anticipated to achieve spectacular growth, with TV display technology and solar markets reaching over $1 billion per year in revenue by 2021. Qdot cancer imaging / personalized medicine reaches $750 million and quantum dot ID Tags go to $700 million dollars by 2021.

Vendors, including Nanosys and QD Vision synthesize these materials in solution, and formulate them into inks and films. Quantum Dot LEDs (QLED) enable performance and cost benefits.

Quantum Dot LED (QLED) commercial focus has remained on key optical applications: Optical component lasers are emerging as a significant market. LED backlighting for LCD displays, LED general lighting, and solar power quantum dots are beginning to reach the market. Vendors continue to evaluate other applications.

Medical applications are potentially large and beginning to reach a level of maturity that represents real market presence. Early stage work with University College London in cancer imaging is progressing.

According to Susan Eustis, lead author of the team that prepared the study, “Quantum

dots QDs are nano-particles in the range of 2 nm to 10 nm diameter. Quantum dots are tiny bits of semiconductor crystals with optical properties that are determined by their size and shape more than material composition. Their small size is of nanoparticles is only now making them able to be manufactured in commercial quantities. They are made through a synthesis process. Strong growth is anticipated as companies master manufacturing techniques that allow consistent production”

Quantum dot markets at $306 million in 2014 are anticipated to reach $4.6 billion by 2021 as next generation devices, systems, and displays are triggered by quantum dots. Quantum dots represent the next wave of semi conductor revolution, giving sophisticated functionality based on the size and shape of the nanoparticle not the base material. Because the materials science is so easy to manipulate, the devices can be made very inexpensively with a lot of variety.

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Contents

3 QUANTUM DOT DISPLAY PRODUCT DESCRIPTION

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4 QUANTUM DOT AND QUANTUM DOT LED (QLED) TECHNOLOGY

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5. QUANTUM DOT COMPANY DESCRIPTION

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Tables

TABLES

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