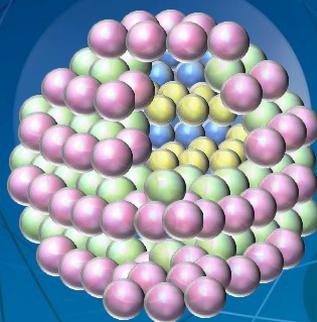


# High-Tech Materials TechVision Opportunity Engine



## Recent Innovations in Quantum Dots

October 23, 2015

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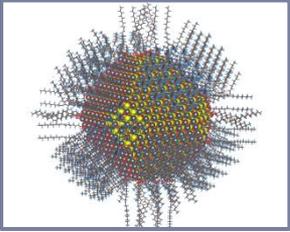


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# Recent Innovations in Quantum Dots

# Quantum Dots Technology—An Overview



Quantum dots (QDs), are nanometer sized particles made of semiconductor materials. They exhibit quantum mechanical properties. The small size of the quantum dots produces quantum confinement effects in all three spatial directions, resulting in finite electron energies. ...

## Key Market Trends

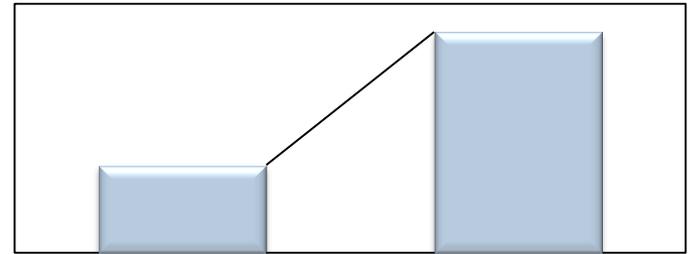
Applications: medical devices, solar cells, light-emitting diode (LED) televisions, solar cells, transistors, and photovoltaics

With growing restrictions on the use of heavy metals in display-based electronics, cadmium-free quantum dots are being adopted widely .

Quantum dots are typically processed using materials such as cadmium selenide, cadmium sulphide, cadmium telluride, indium arsenide, and silicon to name a few.

## Market Potential, Global,

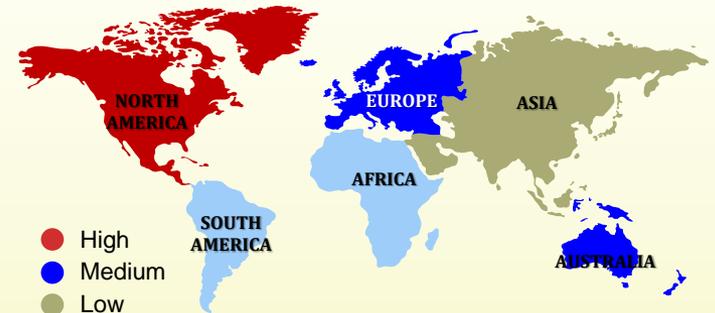
Revenue (\$ Million)



Source: Frost & Sullivan Analysis

## Competitive Landscape

- The North American region has the highest market share of QD technology due to its early adoption of the technology and significant number of research initiatives toward this technology.
- ...



# Strategic Insights

## Drivers

- ✓ Wide applications in display devices can increase QDs' demand in the electronics industry.
- ✓ ...

## Restraints

- ✗ Costs of quantum dots are dependent on the material used for fabrication, which tend to be expensive.
- ✗ .....

## Patent Trends

- From to date, approximately patents have been filed on materials for quantum dots technology, which includes filings related to semiconductor material synthesis and quantum dots manufacturing processes.
- ....

## Funding



- In February Quantum Material Corporation secured funding of an undisclosed amount from Carson Diversified Investments LP (USA) and Carson Haysco Holdings LP (USA) for increasing the production of the tetrapod quantum dot (TQD).
- .....

## The 2020 Scenario

- Growing concerns regarding the use of cadmium in quantum dots could result in the adoption of indium arsenide- and silicon-based quantum dots.
- As quantum dots produces vivid colors, while ....