

# **The Global Market for Green Nanotechnology: Batteries, Filtration, Fuel Cells, Lighting, Green Packaging, Solar, Supercapacitors, Wind Energy, Thermoelectrics, Catalysts and Sustainable Materials**

<https://marketpublishers.com/r/G492AF97C2FEN.html>

Date: September 2017

Pages: 244

Price: US\$ 1,185.00 (Single User License)

ID: G492AF97C2FEN

## **Abstracts**

Nanotechnology and nanomaterials have an important role in all aspects of the energy and environment sectors, enabling sustainable solutions for renewable energy and environmental challenges. A number of products have been commercially developed and more are coming onto the market in:

### **Energy conversion**

New generation of highly efficient solar cells.

Fuel cells.

Thermoelectric devices.

Nanocomposites for stronger and lighter wind energy blades.

Wearable energy harvesting.

### **Energy storage**

Rechargeable batteries.

Lithium-ion batteries for electric vehicles.

Supercapacitors.

Catalysts for optimizing fuel production.

## Energy saving

Aerogel insulation.

Energy saving smart glass for buildings.

LED and OLED lighting.

Nanotechnology will also impact the environmental filtration and remediation industries via:

Safe water purification, filtration and desalination through cheap and portable nanotechnology filters.

Air filtration for removal of domestic and outdoor air pollutants.

Adsorbents and catalysts to remove contaminants.

Nanotechnology will also contribute to other areas of sustainability such as biodegradable and environmentally friendly biopackaging, biocomposites, and bio-based coatings and paints with the properties of non-bio based products.

## Contents

### **1 EXECUTIVE SUMMARY**

- 1.1 Green nanotechnology
- 1.2 Energy conversion
- 1.3 Energy storage
- 1.4 Energy saving.

### **2 RESEARCH METHODOLOGY.**

- 2.1 COMMERCIAL IMPACT RATING SYSTEM.
- 2.2 MARKET CHALLENGES RATING SYSTEM

### **3 INTRODUCTION**

- 3.1 Properties of nanomaterials.
- 3.2 Categorization

### **4 NANOMATERIALS REGULATIONS**

### **5 BATTERIES.**

#### **5.1 MARKET DRIVERS AND TRENDS**

- 5.1.1 Growth in personal electronics, electric vehicles and smart grids markets
- 5.1.2 Reduce dependence on lithium.
- 5.1.3 Shortcomings of existing battery and supercapacitor technology.
- 5.1.4 Reduced costs for widespread application
- 5.1.5 Power sources for flexible electronics

#### **5.2 APPLICATIONS.**

- 5.2.1 Lithium-ion batteries (LIB)
- 5.2.2 Lithium-air batteries.
- 5.2.3 Sodium-ion batteries
- 5.2.4 Magnesium batteries

#### **5.3 MARKET SIZE AND OPPORTUNITY**

- 5.3.1 Total market size.
- 5.3.2 Nanotechnology opportunity.

#### **5.4 MARKET CHALLENGES**

#### **5.5 PRODUCT DEVELOPERS 52-83 (58 company profiles)**

## **6 FILTRATION AND ENVIRONMENTAL REMEDIATION**

### **6.1 MARKET DRIVERS AND TRENDS**

- 6.1.1 Water shortage and population growth.
- 6.1.2 Need for improved and low cost membrane technology.
- 6.1.3 Need for improved groundwater treatment technologies
- 6.1.4 Cost and efficiency
- 6.1.5 Growth in the air filter market.
- 6.1.6 Need for environmentally, safe filters.

### **6.2 APPLICATIONS.**

- 6.2.1 Desalination and water filtration.
- 6.2.2 Airborne filters
- 6.2.3 Gas separation.

### **6.3 MARKET SIZE AND OPPORTUNITY**

- 6.3.1 Total market size.
- 6.3.2 Nanotechnology opportunity.

### **6.4 MARKET CHALLENGES**

- 6.4.1 Uniform pore size and distribution
- 6.4.2 Cost

### **6.5 PRODUCT DEVELOPERS 96-118 (44 company profiles)**

## **7 FUEL CELLS AND HYDROGEN STORAGE.**

### **7.1 MARKET DRIVERS AND TRENDS.**

- 7.1.1 Need for alternative energy sources
- 7.1.2 Demand from transportation and portable and stationary power sectors
- 7.1.3 Temperature problems with current fuel cell technology
- 7.1.4 Reducing corrosion problems
- 7.1.5 Limitations of platinum
- 7.1.6 Reducing cost and increasing reliability of current fuel cell technology

### **7.2 APPLICATIONS**

- 7.2.1 Fuel cells
- 7.2.2 Hydrogen storage

### **7.3 MARKET SIZE AND OPPORTUNITY.**

- 7.3.1 Total market size.
- 7.3.2 Nanotechnology opportunity

### **7.4 MARKET CHALLENGES.**

### **7.5 PRODUCT DEVELOPERS 127-135 (16 company profiles)**

## **8 LIGHTING AND UVC.**

### **8.1 MARKET DRIVERS AND TRENDS.**

- 8.1.1 Need to develop low-cost lighting
- 8.1.2 Environmental regulation.
- 8.1.3 Limited efficiency of phosphors in LEDs
- 8.1.4 Shortcomings with LED lighting technologies
- 8.1.5 Improving flexibility
- 8.1.6 Improving performance and costs of UV-LEDs

### **8.2 APPLICATIONS**

### **8.3 MARKET SIZE AND OPPORTUNITY.**

- 8.3.1 Total market size.
- 8.3.2 Nanotechnology opportunity

### **8.4 MARKET CHALLENGES.**

### **8.5 PRODUCT DEVELOPERS 142-150 (17 company profiles)**

## **9 GREEN PACKAGING**

### **9.1 MARKET DRIVERS AND TRENDS.**

- 9.1.1 Rise in demand for environmentally sustainable packaging.
- 9.1.2 Shortcoming of packaging biopolymers
- 9.1.3 High demand for packaging films resistant to oxygen and moisture to increase shelf life
- 9.1.4 Growth in active packaging.
- 9.1.5 Anti-microbial packaging biofilm market is growing.
- 9.1.6 Need for improved barrier packaging.
- 9.1.7 Growth in barrier food packaging sector

### **9.2 APPLICATIONS**

### **9.3 MARKET SIZE AND OPPORTUNITY.**

- 9.3.1 Total market size.
- 9.3.2 Nanotechnology opportunity

### **9.4 MARKET CHALLENGES.**

### **9.5 PRODUCT DEVELOPERS 163-181 (36 company profiles)**

## **10 SOLAR**

### **10.1 MARKET DRIVERS AND TRENDS.**

- 10.1.1 Need for new materials and novel devices

10.1.2 Need for cost-effective solar energy for wider adoptions

10.1.3 Varying environmental conditions require new coating technology

## 10.2 APPLICATIONS

10.2.1 Solar cells

10.2.2 Solar water splitting.

10.2.3 Solar coatings.

## 10.3 MARKET SIZE AND OPPORTUNITY.

10.3.1 Total market size

10.3.2 Nanotechnology opportunity

## 10.4 MARKET CHALLENGES.

## 10.5 PRODUCT DEVELOPERS 194-211 (34 company profiles)

# 11 SUPERCAPACITORS

## 11.1 MARKET DRIVERS AND TRENDS.

11.1.1 Reducing costs

11.1.2 Demand from portable electronics

11.1.3 Inefficiencies of standard battery technology

11.1.4 Problems with activated carbon.

## 11.2 APPLICATIONS

## 11.3 MARKET SIZE AND OPPORTUNITY.

11.3.1 Total market size

11.3.2 Nanotechnology and nanomaterials opportunity.

## 11.4 MARKET CHALLENGES.

## 11.5 PRODUCT DEVELOPERS 217-222 (9 company profiles)

# 12 CATALYSTS

## 12.1 APPLICATIONS

## 12.2 PRODUCT DEVELOPERS 226-227 (3 company profiles)

# 13 WIND ENERGY

## 13.1 MARKET DRIVERS AND TRENDS.

13.1.1 Need for improved polymer composites.

13.1.2 Need for protective coatings offshore ocean wind and marine energy structures

## 13.2 APPLICATIONS

13.2.1 Nanocomposites

13.2.2 Nanosensors

13.2.3 Nanocoatings

13.3 PRODUCT DEVELOPERS 232-234 (5 company profiles)

## **14 THERMOELECTRICS**

14.1 MARKET DRIVERS AND TRENDS.

14.1.1 Need for clean energy

14.1.2 Lack of efficiency of conducting polymers.

14.1.3 Limitations of current materials

14.2 APPLICATIONS

14.3 PRODUCT DEVELOPERS 238 (5 company profiles)

## List Of Tables

### LIST OF TABLES

Table 1: Categorization of nanomaterials

Table 2: National nanomaterials registries in Europe

Table 3: Nanomaterials regulatory bodies in Australia

Table 4: Market impact assessment for nanotechnology in the batteries market

Table 5: Applications in LIB, by nanomaterials type and benefits thereof.

Table 6: Applications in lithium-air batteries, by nanomaterials type and benefits thereof

Table 7: Applications in sodium-ion batteries, by nanomaterials type and benefits thereof

Table 8: Applications in magnesium batteries, by nanomaterials type and benefits thereof

Table 9: Nanotechnology opportunity in the batteries market-applications, stage of commercialization and estimated economic impact

Table 10: Market challenges in batteries

Table 11: Market challenges rating for nanotechnology and nanomaterials in the batteries market.

Table 12: Market impact assessment for nanotechnology in the filtration and environmental remediation market.

Table 13: Types of filtration

Table 14: Applications in desalination and water filtration, by nanomaterials type and benefits thereof.

Table 15: Applications in airborne filters, by nanomaterials type and benefits thereof

Table 16: Applications in gas separation, by nanomaterials type and benefits thereof

Table 17: Nanomaterials in the filtration and environmental remediation market-applications, stage of commercialization and estimated economic impact

Table 18: Market challenges rating for nanotechnology and nanomaterials in the filtration and environmental remediation market.

Table 19: Market impact assessment for nanotechnology in the fuel cells and hydrogen storage market.

Table 20: Applications in fuel cells, by nanomaterials type and benefits thereof

Table 21: Applications hydrogen storage, by nanomaterials type and benefits thereof

Table 22: Nanotechnology and nanomaterials in the fuel cells and hydrogen storage market-applications, stage of commercialization and estimated economic impact

Table 23: Market challenges rating for nanotechnology and nanomaterials in the fuel cells and hydrogen storage market.

Table 24: Market impact assessment for nanotechnology in the lighting and UVC market

Table 25: Applications in lighting, by nanomaterials type and benefits thereof.



Table 26: Nanotechnology opportunity in the lighting and UVC market-applications, stage of commercialization and estimated economic impact

Table 27: Market challenges rating for nanotechnology and nanomaterials in the lighting and UVC market.

Table 28: Market impact assessment for nanotechnology in the green packaging market

Table 29: Applications in packaging, by nanomaterials type and benefits thereof

Table 30: Application markets, competing materials, nanomaterials advantages and current market size in packaging.

Table 31: Nanomaterials in the packaging market-applications, stage of commercialization and estimated economic impact.

Table 32: Market challenges rating for nanotechnology and nanomaterials in the packaging market.

Table 33: Market impact assessment for nanotechnology in solar market.

Table 34: Market impact assessment for nanotechnology in the solar market

Table 35: Applications in solar, by nanomaterials type and benefits thereof

Table 36: Applications in solar water splitting, by nanomaterials type and benefits thereof.

Table 37: Applications in solar coatings, by nanomaterials type and benefits thereof.

Table 38: Nanotechnology and nanomaterials in the solar market-applications, stage of commercialization and estimated economic impact

Table 39: Market challenges for nanomaterials in solar

Table 40: Market challenges rating for nanotechnology and nanomaterials in the solar market.

Table 41: Market impact assessment for nanotechnology in supercapacitors market

Table 42: Applications in supercapacitors, by nanomaterials type and benefits thereof.

Table 43: Nanotechnology and nanomaterials in the supercapacitors market-applications, stage of commercialization and estimated economic impact

Table 44: Market challenges rating for nanotechnology and nanomaterials in the supercapacitors market.

Table 45: Market impact assessment for nanotechnology in the catalysts market

Table 46: Applications in catalysts, by nanomaterials type and benefits thereof

Table 47: Market impact assessment for nanotechnology the wind energy market

Table 48: Applications in wind energy nanocomposites, by nanomaterials type and benefits thereof.

Table 49: Applications in wind energy nanosensors, by nanomaterials type and benefits thereof.

Table 50: Applications in wind energy nanocoatings, by nanomaterials type and benefits thereof.

Table 51: Market impact assessment for nanotechnology in the thermoelectrics market

Table 52: Applications in thermoelectrics, by nanomaterials type and benefits thereof

## List Of Figures

### LIST OF FIGURES

Figure 1: Energy densities and specific energy of rechargeable batteries

Figure 2: The global lithium-ion battery market and nanotechnology market penetration at the product level, 2015-2025 (Millions USD).

Figure 3: The global desalination market and nanotechnology market penetration at the product level (nano enabled), 2015-2025 (Millions USD).

Figure 4: The global water filtration market and nanotechnology market penetration at the product level (nano enabled), 2015-2025 (Millions USD).

Figure 5: The global fuel cells market and nanotechnology market penetration at the product level (nano enabled), 2015-2025 (Millions USD).

Figure 6: The global lighting market market and nanotechnology market penetration at the product level (nano enabled), 2015-2025 (Millions USD)

Figure 7: The global UVCmarket and nanotechnology market penetration at the product level (nano enabled), 2015-2025 (Millions USD)

Figure 8: The global packaging market and nanotechnology market penetration at the product level (nano enabled), 2015-2025 (Millions USD).

Figure 9: The global solar market and nanotechnology market penetration at the product level (nano enabled), 2015-2025 (Millions USD)

Figure 10: The global supercapacitors market and nanotechnology market penetration at the product level (nano enabled), 2015-2025 (Millions USD)

## I would like to order

Product name: The Global Market for Green Nanotechnology: Batteries, Filtration, Fuel Cells, Lighting, Green Packaging, Solar, Supercapacitors, Wind Energy, Thermoelectrics, Catalysts and Sustainable Materials

Product link: <https://marketpublishers.com/r/G492AF97C2FEN.html>

Price: US\$ 1,185.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

[info@marketpublishers.com](mailto:info@marketpublishers.com)

## Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/G492AF97C2FEN.html>