

# The Global Market for Nanomaterials in Sustainable Biomaterials and Bioplastics

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## Abstracts

Sustainable materials are of growing importance to society for environmental, security, and quality of life reasons. The use of biomaterials and bioplastics has grown rapidly in recent years as many consumers prefer products, especially in market such as packaging, that are sustainable and biodegradable. Recently there has been an increased focus on nanomaterials and renewable polymer resources to produce plastics that do not harm the environment.

A significant challenge in the development of bioplastics is that their mechanical properties are not comparable to petroleum-based plastics. However, the incorporation of nanomaterials into a range of applications allows for the use of less material and vastly improves mechanical and thermal properties, comparable to traditional plastics.

Applications where the use of nanomaterials is contributing to growth in the sustainable biomaterials and bioplastics market include:

Flexible and rigid packaging.

Nanocoatings on paper and plastic webs for vapor barrier.

Strength enhancement in paper, paperboard, and wood building products.

Nanocomposites in structural panels and composite structures.

Smart materials.

Smart packaging.

Printed electronics.

Self-healing materials and coatings.

Sustainable 3D printing.

Markets covered include:

Aerospace: Lightweighting, self-healing, reducing fuel consumption.

Automotive: Bio-based and recycled resins, natural fiber composites, nanofiller-reinforced foams and composites.

Biomedicine: Artificial body parts, tissue engineering, targeted drug delivery.

Construction: Sustainable construction/green building, aerogel insulation, biocement.

Biopackaging: Paper and board packaging, food packaging, barrier films.

## Contents

### **1 INTRODUCTION.**

- 1.1 Aims and objectives of the study.
- 1.2 Market definition
- 1.3 Market scope
  - 1.3.1 Markets covered
  - 1.3.2 Materials covered

### **2 RESEARCH METHODOLOGY**

### **3 EXECUTIVE SUMMARY.**

- 3.1 Bioplastics versus Petroleum-based Plastics.
- 3.2 Market drivers and trends.
  - 3.2.1 Increased use of plant-based renewable materials
  - 3.2.2 Growing use of polymer composites.
  - 3.2.3 Improved performance over traditional composites
  - 3.2.4 Increased use of recycled or waste materials
  - 3.2.5 Reduce dependence on foreign petroleum
  - 3.2.6 Improved materials life cycle-transition to a low-carbon and circular economy.
  - 3.2.7 Increased consumer awareness for sustainable products and packaging
  - 3.2.8 Government support for bioeconomy
- 3.3 Applications.
  - 3.3.1 Nanocomposites
  - 3.3.2 Recycled materials.
  - 3.3.3 Natural Fiber Composites.
  - 3.3.4 Bio-based resins
  - 3.3.5 Bio-based foams
  - 3.3.6 Sustainable 3D printing
- 3.4 Global market size and opportunity
- 3.5 Market challenges

### **4 BIOPLASTICS**

- 4.1 Biobased resins
- 4.2 Renewable biomass materials
- 4.3 Bio-PET

- 4.4 Bio-PP.
- 4.5 PBAT
- 4.6 Bio-Polyethylene (PE)
- 4.7 Polyethylene furanoate (PEF)
- 4.8 PCL
- 4.9 PBS
- 4.10 PHAs (polyhydroxyalkanoates)
- 4.11 PLA (polylactic acid)
- 4.12 Polypropylene carbonate (PPC).

## **5 NANOCOMPOSITES**

### **5.1 CARBON NANOTUBES.**

- 5.1.1 Multi-walled nanotubes (MWNT).
  - 5.1.1.1 Properties.
- 5.1.2 Single-wall carbon nanotubes (SWNT)
  - 5.1.2.1 Properties.
- 5.1.3 Applications in sustainable biomaterials and plastics
- 5.1.4 Carbon Onions
  - 5.1.4.1 Properties.
  - 5.1.4.2 Applications in sustainable biomaterials and plastics
- 5.1.5 Boron Nitride nanotubes (BNNTs)
- 5.1.6 Carbon Nanohorns (CNHs).

### **5.2 FULLERENES**

- 5.2.1 Properties.
- 5.2.2 Applications in in sustainable biomaterials and plastics.

### **5.3 GRAPHENE**

- 5.3.1 Properties.
  - 5.3.1.1 Graphene nanoplatelets (GNPs).
  - 5.3.1.2 Graphene oxide (GO)
  - 5.3.1.3 Applications in sustainable biomaterials and plastics

### **5.4 NANOCELLULOSE**

- 5.4.1 NanoFibrillar Cellulose (NFC)
  - 5.4.1.1 Applications in in sustainable biomaterials and plastics.
- 5.4.2 NanoCrystalline Cellulose (NCC)
  - 5.4.2.1 Applications in in sustainable biomaterials and plastics.
- 5.4.3 Bacterial Cellulose (BCC).
  - 5.4.3.1 Applications in in sustainable biomaterials and plastics.

### **5.5 NANOCLAYS.**

5.5.1 Properties.

5.5.2 Applications in sustainable biomaterials and plastics

## **6 3D P/ADDITIVE MANUFACTURING**

6.1 GREEN 3D PRINTING

6.2 Cellulose nanofibers

6.3 Graphene

## **7 RECYCLED AND AGRICULTURAL COMPOSITES**

7.1 POST CONSUMER PLASTICS

7.2 BIO-BASED CARBON FIBERS

7.3 NANOCELLULOSE

7.4 AGRICULTURAL WASTES

## **8 SMART MATERIALS AND COATINGS**

8.1 Smart coatings

## **9 SELF-HEALING MATERIALS**

9.1 Extrinsic self-healing

9.2 Capsule-based

9.2.1 Vascular self-healing.

9.2.2 Intrinsic self-healing

9.2.3 Healing volume

9.3 TYPES OF SELF-HEALING MATERIALS AND COATINGS

9.3.1 Self-healing coatings.

9.3.1.1 Anti-corrosion.

9.3.1.2 Scratch repair.

9.3.2 Self-healing polymer composites.

9.3.3 Self-healing metals.

9.3.3.1 Metal matrix composites.

9.3.4 Self-healing ceramics

9.3.5 Self-healing nanomaterials

9.3.6 Self-healing biomaterials

9.3.7 3d printing of self-healing materials

## **10 BIOBASED GELS AND POROUS MATERIALS.**

10.1 Hydrogels.

10.2 Biobased aerogels.

## **11 MAIN MARKETS FOR NANOMATERIALS IN SUSTAINABLE BIOMATERIALS AND PLASTICS.**

11.1 AEROSPACE AND AVIATION.

11.1.1 MARKET DRIVERS.

11.1.2 APPLICATIONS.

11.1.3 GLOBAL MARKET SIZE AND OPPORTUNITY.

11.1.4 MARKET CHALLENGES.

11.2 AUTOMOTIVE.

11.2.2 APPLICATIONS.

11.2.2.1 Bio-based foams

11.2.2.2 Tires

11.2.2.3 Natural fiber composites.

11.2.2.4 Recycled materials.

11.2.2.5 Nanocomposites

11.2.2.6 Elastomers

11.2.2.7 Additive manufacturing.

11.2.3 GLOBAL MARKET SIZE AND OPPORTUNITY.

11.2.4 MARKET CHALLENGES.

11.3 CONSTRUCTION

11.3.1 MARKET DRIVERS.

11.3.2 APPLICATIONS.

11.3.3 GLOBAL MARKET SIZE AND OPPORTUNITY.

11.3.4 MARKET CHALLENGES.

11.4 PACKAGING (Flexible and rigid)

11.4.1 MARKET DRIVERS.

11.4.2 APPLICATIONS.

11.4.2.1 Paper and board packaging.

11.4.2.2 Bio-nanocomposites

11.4.2.3 Replacing plastics with wood

11.4.3 GLOBAL MARKET SIZE AND OPPORTUNITY.

11.4.4 MARKET CHALLENGES.

11.5 BIOMEDICINE.

11.5.1 MARKET DRIVERS.

#### 11.5.2 APPLICATIONS.

11.5.2.1 Drug delivery

11.5.2.2 Medical implants

11.5.2.3 Tissue engineering.

11.5.2.4 Wound dressings.

11.5.2.5 Lateral flow immunoassay labels.

#### 11.5.3 GLOBAL MARKET SIZE AND OPPORTUNITY.

### **12 OTHER MARKETS**

#### 12.1 SPORTING GOODS

12.1.1 MARKET DRIVERS.

12.1.2 APPLICATIONS.

12.1.3 GLOBAL MARKET SIZE

#### 12.2 WIND ENERGY

12.2.1 MARKET DRIVERS.

12.2.2 APPLICATIONS.

12.2.3 GLOBAL MARKET SIZE

#### 12.3 BIOBASED WATER PURIFICATION AND FILTRATION

12.3.1 MARKET DRIVERS.

12.3.2 APPLICATIONS.

12.3.3 GLOBAL MARKET SIZE

### **13 SUSTAINABLE BIOMATERIALS AND PLASTICS COMPANY PROFILES. 178-306 (245 COMPANY PROFILES)**

### **14 REFERENCES**

## List Of Tables

### LIST OF TABLES

- Table 1: Comparative properties of polymer composites reinforcing materials
- Table 2: Applications in polymer composites, by nanomaterials type and benefits thereof
- Table 3: Global consumption of sustainable biomaterials and plastics 2015-2025, by type, tons. Base year for estimates is 2015.
- Table 4: Market challenges for use of nanomaterials in sustainable biomaterials and plastics
- Table 5: Type of biobased resins
- Table 6: Properties of single-walled carbon nanotubes.
- Table 7: Carbon nanotubes in sustainable biomaterials and plastics-markets, benefits and applications
- Table 8: Comparison between single-walled carbon nanotubes (SWCNT) and multi-walled carbon nanotubes
- Table 9: Properties of graphene.
- Table 10: Comparative properties of carbon materials
- Table 11: Graphene properties relevant to application in polymer composites
- Table 12: Graphene in composites-markets, benefits and applications
- Table 13: Applications of nanofibrillar cellulose (NFC)
- Table 14: Applications of nanocrystalline cellulose (NCC)
- Table 15: Applications of bacterial cellulose (BC)
- Table 16: Comparative properties of polymer composites reinforcing materials.
- Table 17: Markets, benefits and applications of nanoclays in nanoclays.
- Table 21: Types of smart materials and coatings
- Table 22: Markets for smart materials and coatings.
- Table 23: Types of self-healing coatings and materials.
- Table 24: Comparative properties of self-healing materials.
- Table 25: Properties of self-healing polymers
- Table 26: Recent research in self-healing metals
- Table 27: Types of self-healing nanomaterials.
- Table 28: Applications in aerospace composites.
- Table 30: Global market size for sustainable biomaterials and plastics in aerospace and aviation
- Table 33: Applications of natural fiber composites in vehicles by manufacturers
- Table 34: Natural fiber composites in the automotive industry
- Table 36: Global market size for sustainable biomaterials and plastics in the automotive industry



Table 37: Market challenges for sustainable biomaterials and plastics in the automotive industry

Table 39: Applications in construction.

Table 41: Global market for sustainable biomaterials and plastics in construction and civil engineering.

Table 43: Market challenges for sustainable biomaterials and plastics in construction and civil engineering.

Table 45: Applications in biopackaging

Table 46: Biomaterials in packaging-current materials, biomaterials, advantages and market size

Table 41: Global market for sustainable biomaterials and plastics in packaging.

Table 49: Market challenges for for sustainable biomaterials and plastics in packaging

Table 88: Applications of sustainable biomaterials and plastics in biomedicine

Table 41: Global market for sustainable biomaterials and plastics in biomedicine.

Table 41: Global market for sustainable biomaterials and plastics in sporting goods

Table 52: Applications in wind energy.

Table 41: Global market for sustainable biomaterials and plastics in wind energy.

Table 41: Global market for sustainable biomaterials and plastics in biobased water purification and filtration

Table 54: Oji transparent NFC sheet

## List Of Figures

### LIST OF FIGURES

Figure 1: Global consumption of sustainable biomaterials and plastics 2015-2025, by type, tons. Base year for estimates is 2015.

Figure 2: Global production of bioplastics, 2017-2025

Figure 3: Global production of bioplastics in 2017 (by material type)

Figure 4: Global production bioplastics in 2017 (by market segment)

Figure 5: Global production of bioplastics in 2017 (by region)

Figure 6: Schematic of single-walled carbon nanotube.

Figure 7: TEM image of carbon onion.

Figure 8: Schematic of Boron Nitride nanotubes (BNNTs). Alternating B and N atoms are shown in blue and red

Figure 9: Schematic representation of carbon nanohorns

Figure 10: Fullerene schematic

Figure 11: TEM image of cellulose nanocrystals

Figure 12: Nanoclays structure. The dimensions of a clay platelet are typically 200-1000 nm in lateral dimension and 1 nm thick

Figure 13: TEM of montmorillonite

Figure 14: TEM of halloysite nanotubes

Figure 15: Schematic of self-healing polymers. Capsule based (a), vascular (b), and intrinsic (c) schemes for self-healing materials. Red and blue colours indicate chemical species which react (purple) to heal damage

Figure 16: Stages of self-healing mechanism

Figure 17: Self-healing mechanism in vascular self-healing systems

Figure 18: Comparison of self-healing systems

Figure 19: Self-healing mechanism of polymers

Figure 20: Nanomaterials-based automotive components

Figure 21: Soy-based foam.

Figure 22: Antistatic graphene tire.

Figure 23: Asahi Kasei CNF fabric sheet

Figure 24: Properties of Asahi Kasei cellulose nanofiber nonwoven fabric.

Figure 25: CNC produced at Tech Futures' pilot plant; cloudy suspension (1 wt.%), gel-like (10 wt.%), flake-like crystals, and very fine powder. Product advantages include:.

Figure 26: CNF transparent film

Figure 27: CNF wet powder

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