

# The Global Market for High Impact Nanomaterials: Nanocellulose, Carbon Nanotubes, Graphene and 2-D Nanomaterials

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## Abstracts

Many industries including electronics, automotive, aerospace, telecommunications and healthcare are exploring the use of high impact nanomaterials such as nanocellulose, carbon nanotubes and graphene. Other 2-D nanomaterials such as silicene, graphyne, graphdiyne, graphane and molybdenum disulfide are under intense study. CNTs and graphene are the strongest, lightest and most conductive fibers known to man, with a performance-per-weight greater than any other material.

## Nanocellulose, Carbon Nanotubes, Graphene and 2-D Nanomaterials

All of these materials possess outstanding properties and represent potentially the most economically viable and lucrative nanomaterials through to the middle of the next decade and beyond. Most are relatively new nanomaterials but are coming onto the market fast and will find widespread applications over the next decade in sectors such as composites, electronics, filtration, medical and life sciences, oil and energy, automotive, aerospace, coatings, military, consumer goods and sensors.

## Nanocellulose

Nanocellulose is also being developed for use in novel applications ranging from scaffolds in tissue engineering, artificial skin and cartilage, wound healing and vessel substitutes to biodegradable food packaging. Applications in polymer reinforcement and anti-microbial films will be hitting the market soon. FP Innovations estimates the market to be worth \$250 million in North America by 2020. The USDA has forecast the global market could amount to over 35 million tons per annum by 2040.

## **Carbon Nanotubes**

Transparent conductors (TCs), battery additives and transistors represent the most promising markets for CNTs. They are widely viewed as viable candidates as alternatives to Indium tin oxide (ITO) in TCs and the main candidate to replace silicon in transistors.

## **Graphene and 2-D Nanomaterials**

The global market for graphene continues to grow with weekly technology and production breakthroughs, new investment and public listings of graphene producers. Driven by demand from markets where advanced materials are required, graphene promises to outstrip all current nanomaterials, especially in electronics and energy storage applications. Other markets graphene is impacting include aerospace, automotive, coatings and paints, communications, sensors, solar, oil, and lubricants.

This 539 page report outlines the global scenario for these materials including:

Industry growth and prospects

Industry structure

Historical data

Market forecasts

Key market drivers and restraints

Technology roadmaps and application timelines

Producers, research centre and application developer profiles

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