

**Contact:****Richard Jun Li**

Innova Research

+86-21-13916132098

[Richard.Jun.Li@innovaresearchinc.com](mailto:Richard.Jun.Li@innovaresearchinc.com)**Innova Research Identifies the Top 9 Graphene Trends for 2018**

SHANGHAI, CHINA – February 8, 2018 – Based on the “Top 7 Graphene Trends for 2017” Innova Research published at the beginning of 2017, the company recently summarized the top 9 emerging trends in the world of graphene for 2018 and beyond. Again, these include the graphene market trends, technology evolution, the development of downstream graphene applications, and the graphene industry standards and regulations, among others.

**Raw materials for producing graphene nanoplatelets will diversify**

The traditional raw material for producing graphene nanoplatelets is graphite. However, it was reported that scientists have started to use easy-to-get and renewable raw materials to produce graphene. These raw materials include soybean oil and waste biomass and other affordable precursors to be explored.

**Technology breakthrough on producing graphene films will continue to be seen**

In the past year, technology breakthrough was seen at the preparation of graphene films. Such examples include growing graphene films on nano-diamond substrate materials, an improvement on the CVD process to accelerate the growth speed of the graphene films, and a low-temperature CVD process to directly grow the graphene films on plastics and other substrates avoiding the possible damage when transferring the graphene films. The progresses of graphene film producing technologies are expected to improve the yield and therefore reduce the costs of the graphene films.

**Prices of graphene materials will continue to fall**

The prices of graphene materials, including nanoplatelets and films, will continue to drop in 2018. In 2017, some graphene suppliers launched multiple-layer graphene nanoplatelets (in powder form) that were priced at less than US\$10/kg. Due to the increasing price competition, especially at the low-end graphene product market, the average selling prices of graphene will continue to fall in the coming years.

**Solid progresses are made to set up graphene industry standards**

As of today, there is no universally recognized graphene industry standard globally. However, continuous efforts have been made by graphene researchers and industry players to make such industry standards. In October 2017, the National Physical Laboratory UK (NPL) published the first graphene ISO standard in the world. In China, 46 graphene industry standard items were discussed by a committee formed by dozens of leading graphene researchers and industry players to make the national graphene standards. Innova Research expects that the Chinese graphene industry standards will be introduced in 2018.

**The penetration of graphene materials in electronics devices will accelerate**

Electronics is the largest graphene application by revenue, according to the “World Market for Graphene 2017 Edition” published by Innova Research. Apart from graphene-enabled RFID (radio frequency identification), EMI shielding and ESD protection components which are making progresses towards mass adoption, graphene has been adopted by other electronics devices such as logic devices, sensors, UV-LED, among others. The adoption of graphene in electronics applications will accelerate in 2018.

### **Graphene in energy storage sees breakthrough**

Graphene has been successfully adopted in the electrolyte enhancement and as heat dissipation in lithium-ion battery (LIB) packaging. In 2017, some progresses were also seen on the adoption of graphene in electrode protection inert films and electrode itself. In addition, Innova Research expects that graphene-assisting supercapacitors and solar cells will be launched in the next few years.

### **Graphene-enabled anti-corrosion coating and functional textile continues to grow**

Graphene-enabled anti-corrosion coating has already achieved scaled shipments around the world. With the prices of graphene decrease further, graphene-enabled coating is expected to extend its reach from the current high-end coating market to medium-end coating market in the next few years. Moreover, the use of graphene-enabled functional textiles in sports, underwear, and fire protection are emerging.

### **Adoption of graphene in automotive starts**

Graphene-enhanced LIBs have been adopted by electric vehicles to realize fast charging and other functions. In 2017, a graphene concept vehicle (BAC Mono) was shown on the World Mobile Congress. The recently revealed Fisker Emotion also adopts graphene-electrolyte all-solid-state batteries. Besides, some Chinese companies are introducing graphene-enhanced tires for cars. Innova Research predicts that more and more graphene-enhanced materials and devices will be used on vehicles. Apart from the batteries, the initial use cases could be graphene-enabled light weight composite structural materials, automotive sensors, heat dissipation and management, among others.

### **Investments in graphene to grow continuously**

In China, graphene has been reaffirmed by “the 13<sup>th</sup> Five-Year Plan” as a strategic new material. This means government guidance funds and other investments, as well as favorable policies will continue to support graphene research and the commercialization of the relevant technologies in the coming years. Globally, large graphene investments include the investment of 60 million Pounds by Masdar, Higher Education Funding Council for England’s UK Research Partnership Investment Fund (UKRPIF) and Innovative UK, to set up the Graphene Engineering Innovation Center (GEIC) which will start operation this year.

Dr. Nancy Wu, research director of Innova Research commented: “The decrease of the prices and the improvement on the quality of graphene products will motivate more downstream applications. Looking forward, the adoption of graphene in electronics, composite materials, and energy storage applications, among other fields will accelerate. Besides, the introduction of graphene industry standards will also have positive impact on the graphene market in the coming years.”

(End)

### **About Innova Research**

Innova Research is a market research and consulting firm focusing on emerging technologies. With the combination of both technology and market research experts, we offer world-class market and technology intelligences. Driven by primary research, Innova Research's market intelligence reports and consulting service help our clients to make right strategic and investment decisions in the fast-changing technology world. Visit [www.innovaresearchinc.com](http://www.innovaresearchinc.com) for more information.