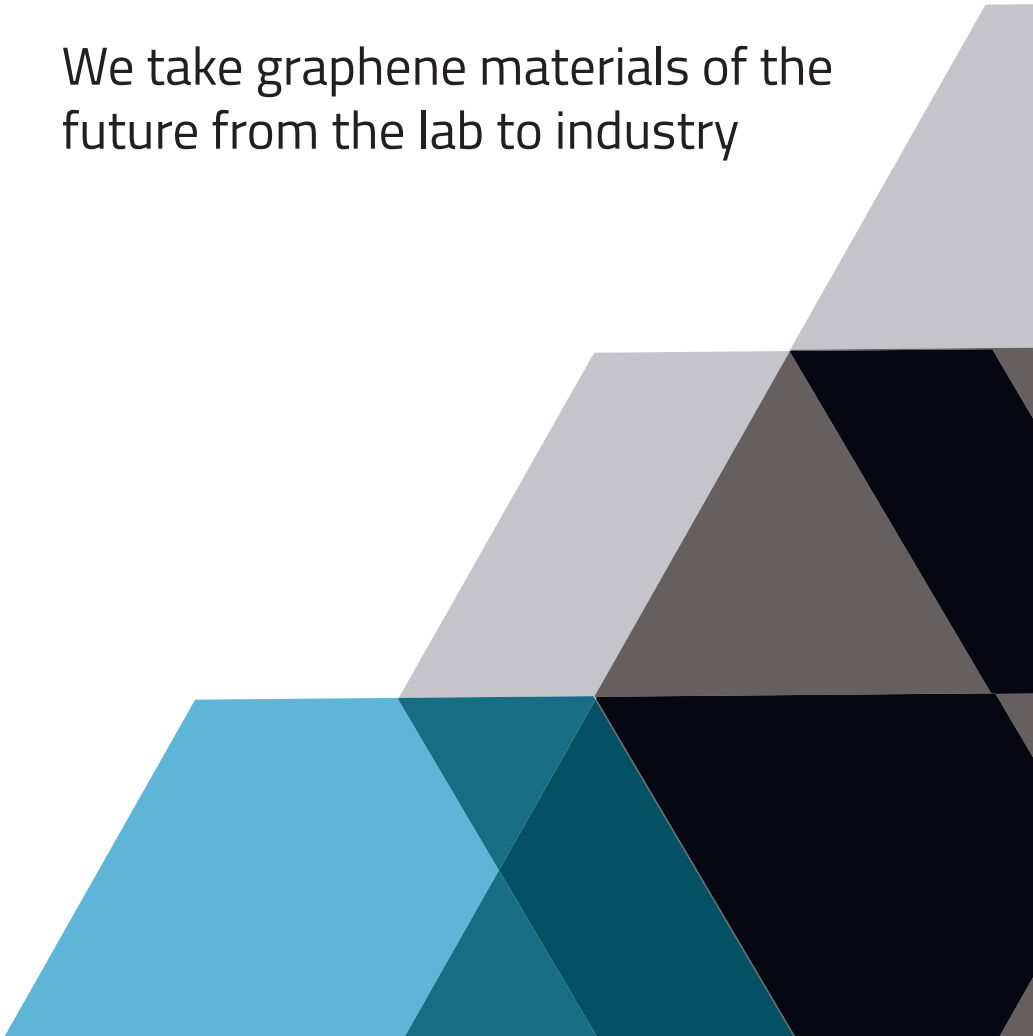




 **SIO** GRAFEN

We take graphene materials of the  
future from the lab to industry



## Research + companies = true

Stronger than steel, transparent and flexible while being electrically and thermally conductive. The extraordinary characteristics of graphene makes it a material with limitless opportunities.

Perhaps it is the answer to a number of today's challenges in different areas. Graphene can be used in everything from coatings, printed electronics or packaging materials to electronics and energy storage in spacecraft and satellites.

**SIO Grafen** is a Swedish national Strategic Innovation Programme with the ambition to strengthen collaboration between industry and research providers in graphene application areas, by identifying and bringing together key players in value chains towards applications. SIO Grafen is supported by Vinnova, the Swedish Energy Agency and the Swedish Research Council Formas.

The task of the program is to transform today's immature and fragmented industry into an established and advancing industry. We are working together to get more graphene innovations on the market.

**The vision is that Sweden should be among the top ten countries in deploying graphene to ensure industrial leadership in advanced technology by 2030.**

## Areas of strength

The areas of strength within SIO Graphene, are areas with strong Swedish industrial interest, where graphene is expected to contribute to increased competitiveness.

### Electronics



Graphene can replace silver or carbon black as additives in leading ink in **printed electronics**, which reduces environmental and health impact. Graphene-based **optoelectronics** is an exciting area for the next generation of integrated optical transmitter/transceivers. The electronics area also consists of, for example, **sensors** and **high frequency electronics**.

### Composites



Graphene can provide brand new and multifunctional properties to composites. For example, they can be made both thermally and electrically conductive, may have increased barrier-properties as well as contribute to shorter production time. Composites can be made significantly stronger alternatively lighter with the same mechanical properties. Graphene can be used in smart **textiles, metal, concrete** and **polymers with or without fiber**.

### Coatings



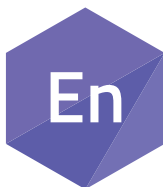
**Coating** can be either to protect a surface, for example against corrosion and growth in tough environments, or to regulate the flow of gases and liquids into **barrier layers, membranes** or **filters**. Graphene has very good performance in these areas and can be used when there are high demands on barrier effects, such as packaging of food and pharmaceuticals.

Read more about the areas of strength within SIO Grafen, objectives and activities in **Agenda Graphene 2018 - short version**.



## Manufacturing

Both broad and sharp skills in the **manufacturing** of graphene are a necessary basis for all the graphene related activities. In Sweden there are good conditions for international competitiveness; graphite mines, mines, manufacturers of graphene flakes, graphene on silicon carbide and to some extent graphene film. The area also includes **production and process development**. Sweden also has experts on **characterisation**.



## Energy

Thanks to its high surface area, **electrical conductivity** and mechanical properties, graphene can be used for **storage of energy** in batteries and supercondensers, as well as for the **generation of energy** in solar cells. The **thermal conductivity** can for example be used for cooling electronics.



## Biotechnology

In **medical technology**, benefits such as biocompatibility, the ability to bend around for example the shape of the eye, electrical conductivity and similar can be used for sensors, electrodes and implants. The area is still at an early stage. The biotechnology area also includes issues such as **environmental and health aspects**.

## Objectives

- Establish graphene as a Swedish area of strength
- Strengthen cooperation
- Stimulate the availability of Swedish graphene materials

## Activities within SIO Grafen

- Open calls for funding of collaborative innovation projects performed by companies and research partners.
- Workshops within important areas, including Svenskt Grafenforum results workshop.
- Coaching in graphene related issues. We can visit your organisation to discuss how graphene can improve your products and production processes.
- Research reports as well as actor, supplier and characterisation guides.
- Research and Business Intelligence Reports and newsletters with information on ongoing activities and calls. Subscribe by contacting us at [info@siografen.se](mailto:info@siografen.se).

## How to be involved

As a sponsor partner, you and your organisation can influence the Swedish graphene effort by participation in board work and by participating at the General Assembly.

If you are interested in becoming a partner, please contact us at [info@siografen.se](mailto:info@siografen.se).

## FLAG-ERA

FLAG-ERA (Flagship ERA-NET) is a network of 39 national funding agencies from 2 countries in Europe. The network gives researchers the possibility to complement the existing flagship projects through cross-border open calls between the national research financiers. Sweden participates through Vinnova and the Swedish Research Council.

[flagera.eu](http://flagera.eu)

## Graphene Flagship

SIO Grafen is cooperating with the Graphene Flagship, a ten-year projekt with more than 150 partners from 23 countries, and more than 60 associated members. Research and development is performed within 15 different technical areas. The task is to take graphene from research into product in the European society in the space of 10 years. The flagship is coordinated by Chalmers University of Technology since 2013.

[graphene-flagship.eu](http://graphene-flagship.eu)

## Påverkansplattform grafenteknologier

The aim is to help Swedish actors make use of financing and cooperation opportunities within the EU, by ensuring that Swedish interests are taken into account in the announcements made. In the long run, the goal is to ensure strong Swedish participation in major future European initiatives on graphene.

[vinnova.se/p/paverkansplattform-grafen-teknologier](http://vinnova.se/p/paverkansplattform-grafen-teknologier)

## SIO Grafen – the Strategic Innovation Programme for Graphene

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