

# SIO Grafen: Demonstrator projects for commercial applications with 2D- materials - 2024

A call within the strategic innovation program SIO Grafen.

The strategic innovation program **SIO Grafen** is part of **Vinnova's, the Swedish Energy Agency's and Formas'** joint investment in strategic innovation areas. The purpose of the investment in strategic innovation areas is to create conditions for international competitiveness and sustainable solutions to global societal challenges.

SIO Grafen takes 2D materials from the lab to societal use. We aim for Swedish companies to become world leaders in 2D materials. Our goal is that Sweden is one of the world's leading countries in developing and using 2D materials industrially.

Read more about the program and the more than 200 projects that have been funded so far on [siografen.se](https://siografen.se).



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## 1 The offer in brief

**SIO Grafen is taking 2D materials from the lab to societal use. Together we make it happen.**

**Our goal is that Sweden is one of world's the leading countries in developing and using 2D materials industrially. Let's make this a reality.**

In **SIO Grafen's last call** we are continuing the acceleration of Swedish innovation in 2D materials by **demonstrator projects** developing and value chains, strengthening collaboration, and stimulating Swedish 2D material supply.

Requirements to prepare an application:

- A project result that develops the competitiveness of Swedish industry.
- An identified solution where material development connected to 2D materials addresses an industrial need.
- Partners with ability to develop a value chain supporting future implementation and use.
- At least three partners along a value chain, of which at least two companies.
- At least one Swedish<sup>1</sup> company in the project.

All projects in the call should contribute to SIO Grafen's goals and effect logic, Appendix 1. SIO Grafen focuses on graphene and other 2D materials. Material types included in the call are described in Appendix 2.

This call is the last one planned within SIO Grafen.

### Schedule for the call

All dates are preliminary. For updated information, please go to [vinnova.se](https://www.vinnova.se).

The call opens:	1 March 2024
Deadline for applications:	19 September 2024, at 14:00 CET
Decision date, latest:	15 November 2024
Earliest date for project start:	15 November 2024
Latest date for project start:	20 November 2024
Latest date for project end:	15 October 2026

### Webinar

A webinar presenting the call will take place 19 March at 14.00. Registration to the webinar is made at [siografen.se](https://siografen.se), heading *Nyheter/Kalender*.

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<sup>1</sup> "Swedish" company refers to a Swedish-registered limited liability company or a foreign company that has a branch or place of business in Sweden and where the costs of the project are attributable to the branch's or place of business's operations.

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[helpdesk@vinnova.se](mailto:helpdesk@vinnova.se)

Up-to-date information about the offer and a link to Vinnova's application service portal is available at [vinnova.se](https://vinnova.se).

## 2 What does SIO Grafen want to achieve with this call?

### **Taking 2D materials from the lab to societal use.**

SIO Grafen's goal is that Sweden is one of the leading countries in the world in developing and using 2D materials industrially. SIO Grafen projects are the enablers making us fulfil the vision.

All projects should be based on an industrial need that has an identified solution where 2D material gives an obvious benefit. The projects should develop and establish new value chains, strengthening collaboration, stimulating Swedish supply of 2D materials, and contribute to the sustainability goals.

It is important that the projects create new knowledge. In the application you should use 1-2 pages to describe the state-of-the-art with most recent advances, technologies and research as well as your project's contribution beyond state-of-the-art.

All projects financed in the call should contribute to the goals and effect logic of SIO Grafen, as shown in Appendix 1.

The call will contribute to make more results available for free and for all, scientific contributions must be published in open access.

### **Contribution to Agenda 2030**

SIO Grafen encourages the actors to collaboratively develop their innovation capacity and create new solutions that contribute to the goals for sustainable development stated in Agenda 2030.

The projects within SIO Grafen contribute to reach the goals for sustainable development in Agenda 2030<sup>2</sup>. Examples of contributions from projects within SIO Grafen are: improved resource effectiveness by extending products' lifespan, increased energy effectiveness by improved batteries, and fighting infectious diseases by creating anti-bacterial surfaces. The application should describe how your project contributes to reach the Agenda 2030 goals, evaluated in the assessment process.

The projects are expected to contribute to gender equal development by ensuring that both women and men take part in grants in an equal way, that they have influence over the project and that they actively participate in the project's

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<sup>2</sup> See <https://www.vinnova.se/m/agenda-2030/>

implementation. The projects financed in the call should prepare to integrate this perspective in future work.<sup>3</sup>

One other aspect to be considered is analysing whether gender aspects are relevant for the intended solutions problem area and utilization. This is a question mandatory to answer for all applicants and can be found under the heading “Projektuppgifter” in the application. The question will not be evaluated for this call.

For more information, a webinar on “How to create equal projects” was held in connection to a SIO Grafen call in 2020. The webinar (in Swedish) is available using the link <https://www.gotostage.com/channel/siografen>.

### 3 To whom is the call directed?

The offer is directed to companies, research institutes, universities, or other legal entities who, in collaboration, would like to develop 2D materials for industrial applications.

The required number and type of partners in the project consortium are at least **three partners**, of which at least **two companies**. **One Swedish company**<sup>4</sup> is required to be part of the project consortium for all three project forms.

Foreign actors, without a registered branch or place of business in Sweden, can be included as project partners if they are an important part of the project’s value chain. The application should motivate in what way the organization contributes to a value chain that supports Swedish industries and their competitiveness. The participation in the project is on equal terms as other partners with the exception that the foreign actor cannot receive support from Vinnova. However, the in-kind work of the organization is included in the total budget of the project, meaning that they are co-financing at least 50 percent of the project’s total eligible costs not financed by Vinnova.

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<sup>3</sup> Find out more about what Vinnova’s work for equal innovation means for those who are applying for funding from Vinnova: <https://www.vinnova.se/en/m/equal-innovation/>

<sup>4</sup> “Swedish” company refers to a Swedish-registered limited liability company or a foreign company that has a branch or place of business in Sweden and where the costs of the project are attributable to the branch's or place of business's operations.

## 4 What is funded?

### 4.1 Activities eligible for funding

The type of project activities that can be funded in this call should be included in the support type **Experimental development**. A short description of the different support types are found in [Stödnivåer, definitioner m.m. för bidrag enligt Vinnovas stödordning](#) (in Swedish).

SIO Grafen covers all types of 2D materials. The call includes all types of 2D materials according to the definition in Appendix 2.

The project should relate to one of SIO Grafen's areas of strength:

- Biotechnology
- Composites
- Electronics
- Energy
- Manufacturing
- Surface coatings

The project should develop an application of 2D material demanded by the companies in the consortium. The application should be based on development of 2D materials to improve material properties or functions:

- of the 2D material,
- for a composite containing 2D material,
- in the manufacturing process,
- or in the function of a product or application.

SIO Grafen do not finance project proposals based on using or integrating an already developed graphene product in an application.

### 4.2 Conditions for receiving funding

Vinnovas funding is provided in the form of grants. Funding for organizations that operate economic activities is subject to regulations regarding state aid.<sup>5</sup> These regulations govern which costs and what proportion of these costs may be covered by the grant. The basic conditions for a cost to be eligible are that it must:

- Be carried by the applicant organization.
- Be attributable to the project.
- Have arisen during the project period.

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<sup>5</sup> Read more about state support on Vinnova's website: <https://www.vinnova.se/sok-finansiering/regler-for-finansiering/statligt-stod/>. There you will also find Vinnova's general terms and conditions for grants and an instruction to eligible costs: <https://www.vinnova.se/sok-finansiering/regler-for-finansiering/allmanna-villkor/>

- Be determined in accordance with the applicant's usual accounting principles and good accounting practice.
- Be in accordance with the applicant's internal policies and guidelines.

Accounting for project costs must be separated in the accounting from the applicant's other transactions.

## 5 Project form demonstrator project

The call applies to demonstrator projects.

Figure 1 shows how the project form relate to the Technology Readiness Levels, TRL. TRL is a method to describe the maturity level of a technology.

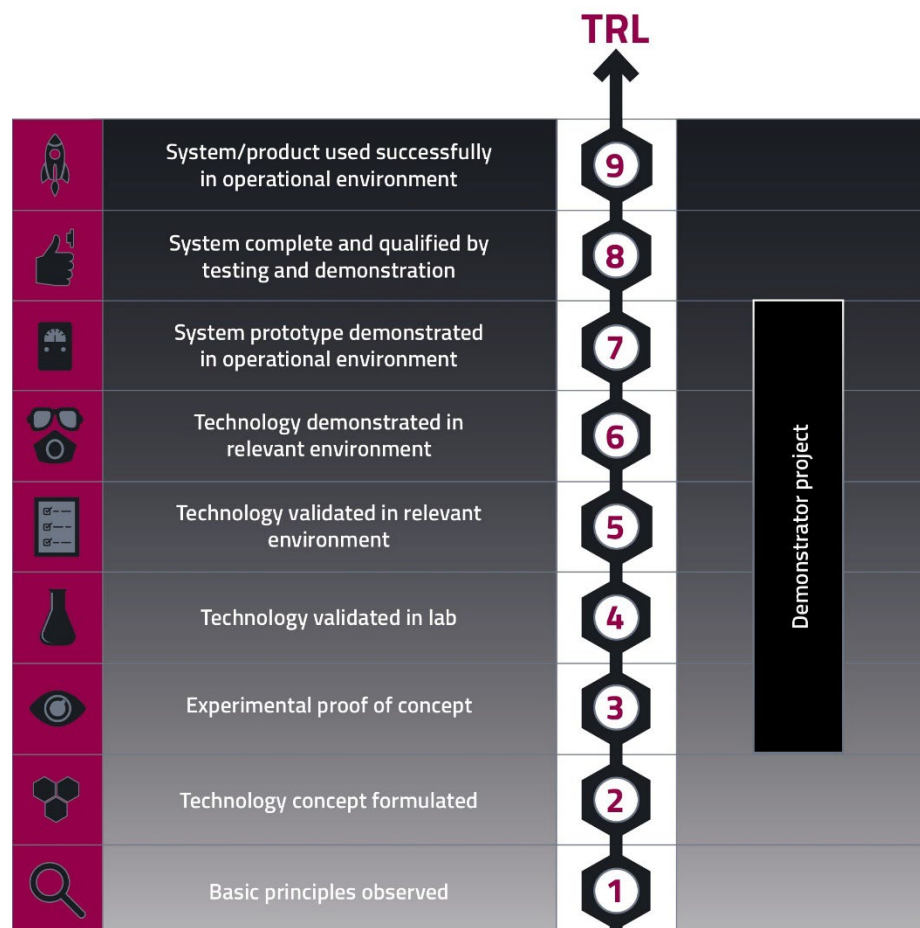


Figure 1 Demonstrator projects related to TRL.



## 5.1 Demonstrator project

Requirements to apply for a Demonstrator project:

- An industrial relevant concept at minimum TRL 3. The concept should be based on a 2D material (according to definition in Appendix 2).
- At least **three partners** along a value chain, of which at least **two companies**.
- At least **one Swedish company** should be part of the consortium.
- One company in the consortium should intend to implement the result of the project in their future operations.

Examples of activities in the project:

- To produce a physical prototype.
- To validate in laboratory of simulated environment.
- To demonstrate in simulated or real environment.
- To develop new concepts for manufacturing or up-scaling.

Expected results:

- Demonstration of the concept in relevant environment, that is the concept has reached at least TRL 6.
- Production of a physical demonstrator.
- Knowledge beyond state of the art on graphene or other 2D materials and their applications.
- Knowledge of implementation and communication of the results.
- Creation of the complete value chain.

Maximum project time is 23 months.

There is no maximum funding per project.

We are expecting to finance 2–6 projects within the call budget.

The assessment criteria includes that the result of the project is of importance for the competitiveness of Swedish industry. Requirements on the project's results will increase for projects seeking a large share of the call's total budget.

## 6 How much funding is available?

The total budget of the call is expected to be **SEK 10 million**.

There is **no maximum funding per project**.

We are expecting to finance 2–6 projects within the call budget.

The maximum grant may not exceed **50 percent** of the project's total eligible costs. The remaining funding shall come from participating project partners' in-kind.

Note that the maximum support level per *project* is not the same as the maximum allowable support level per *project partner*. The level of support for each project partner is limited for companies by the rules on state aid (section 4).

Please observe that different support types can be applicable depending on the activities in the project. Because of this, the **maximum level of support per partner could vary**. Read more in [Stödnivåer, definitioner m.m. för bidrag enligt Vinnovas stödordning](#) (in Swedish).

Contributions to parties whose activities in the project do not constitute economic activity will not be covered by the state aid rules. These will be granted grants with a maximum support level of 100 percent.

## 7 Prerequisites for us to assess the proposals

We will only assess applications that meet the following formal eligibility requirements:

- Development connected to 2D materials (according to Appendix 2) is included.
  - The project parties are legal entities.
  - The coordinator is a Swedish legal entity.
  - At least three partners of which at least two companies in the project consortium.
  - At least one Swedish<sup>6</sup> company in the project consortium.
  - The application strictly follows all instructions and mandatory templates and appendix given in section 10.
- The proposal is written in Swedish or English.

## 8 Assessment of applications

### 8.1 What do we assess?

The project proposal will be assessed on the basis of the following criteria:

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<sup>6</sup> “Swedish” company refers to a Swedish-registered limited liability company or a foreign company that has a branch or place of business in Sweden and where the costs of the project are attributable to the branch's or place of business's operations.

### **Potential**

- That the goal of the project contributes to SIO Grafen's goal that Sweden is one of the leading countries in the world in developing and using 2D materials (as described in Appendix 2) industrially.
- That the result of the project is of importance for the competitiveness of Swedish industry.
- That the project is innovative and contributes to knowledge beyond state-of-the-art.
- That implementation of the result of the project has a positive contribution to the global goals in Agenda 2030.

### **Actors**

- That the project consortium has the appropriate competence, ability, and commitment for the project.
- That the project team is well composed with regard to gender distribution, including the distribution of power and influence.
- That the project develops or strengthens the Swedish value chain for 2D materials (as described in Appendix 2).

### **Feasibility**

- That the solution developed in the project is on a level suitable for a demonstrator project.
- That the goals set out in the project plan are clear, measurable and that the activities are described with realism, credibility and are relevant in relation to the goals.

## **8.2 How do we assess?**

The proposals are assessed in competition with all other proposals received. The assessment is based on the electronic proposal submitted to Vinnova via Vinnova's e-services (see section 10).

The proposals are evaluated by an external evaluation panel specially appointed by Vinnova. The evaluator panel gives a recommendation to Vinnova.

Vinnova decides about financing based on the recommendation of the evaluator panel, taking into account any opinion regarding the program portfolio made by the strategic innovation program SIO Grafen.

## **9 Decisions and conditions**

### **9.1 About Vinnova's decisions**

The basis for support appears in the decision and also governs which costs are eligible for support.

Our decision to grant or reject a proposal cannot be appealed.

## 9.2 Terms and conditions for grants

For granted funding, our general terms and conditions for funding apply<sup>7</sup>. The terms and conditions include rules on project agreements, conditions for payment, follow-up, reporting and utilization of results. Scientific publications shall be available in open access in accordance with Vinnova's instructions<sup>8</sup>.

Since the call is made within the framework of strategic innovation programmes, the following special conditions also apply:

- The project must be represented by at least one project partner at Swedish Graphene Forum, organized annually by SIO Grafen.
- When informing about the project and at all publication of project results, it must be stated that: the work has been carried out within the strategic innovation program SIO Grafen, a joint effort by Vinnova, Formas and the Swedish Energy Agency.

The following also applies to the relation between the project and the program office of SIO Grafen:

- The Project Summary should be sent to SIO Grafen by e mail [info@siografen.se](mailto:info@siografen.se) when the application is sent to Vinnova.
- The Project Summary will be published on [siografen.se](https://siografen.se) when the project starts.
- The projects should support SIO Grafen with examples of applications and success stories that can be disseminated without restriction.
- After finalizing the project, the public project summary sent to Vinnova to publish in their project database will replace the Project Summary on [siografen.se](https://siografen.se).

NOTE! Project summaries at project start and end of projects must be able to be distributed and published freely and must not contain confidential or otherwise sensitive information.

Additional specific conditions may be decided for individual projects.

If you do not comply with Vinnova's terms and conditions, you may be liable to repay. This also applies if you have been awarded a funding incorrectly or with too high an amount.

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<sup>7</sup> . You can find the terms and conditions, together with help to understand and fulfil the conditions [Terms and conditions for Vinnova funding | Vinnova](#). Please note that we have translated our terms and conditions from Swedish. If there are differences between the English and Swedish versions, the Swedish version applies

<sup>8</sup> [Anvisningar för öppen tillgång till vetenskapliga publikationer](#)

## 10 How to apply

To apply for funding, fill in a web-based form using Vinnova's e-services, accessed via [www.vinnova.se](http://www.vinnova.se). In addition to the web-based form, you also upload the following mandatory attachments<sup>9</sup>:

- **The project description** according to the template found on the website of the call. The description should include a maximum of 10 standing A4 pages *beyond* page 1 (page 1 includes "Project title", "Project facts" and "Summary" in the template)  
The text should be written in Swedish or English with 12-point black text. References to any information on web pages and similar are not taken into account by the evaluators when assessing. The proposal should cover all parts, including format and heading in tables.
- **CV-appendix** according to the template found on the website of the call. The appendix should include relevant CVs for the project manager and all key people in the project team. At least one CV from each project partner should be included.

**In direct connection with submitting the proposal to Vinnova, the appendix Project Summary must also be sent to the program office for SIO Grafen via e-mail to [info@siografen.se](mailto:info@siografen.se).** The Project Summary must be freely publishable and must therefore not contain confidential or otherwise sensitive information.

Keep in mind that it takes time to make a proposal. You can start filling in details, save, and continue at a later stage. When your proposal is complete, mark it as ready. You can at any time fully unlock the proposal and make changes, right up to the last proposal date.

Mark the proposal ready well in advance of the call deadline.

When the call has closed and the proposal has been registered, a confirmation will be sent out by e-mail to you who are responsible for the user account, project manager and company signatory/head of department. It may take a few hours for you to receive the confirmation.

If you have not received a confirmation email within 24 hours of the call closing, please contact us.

When the proposal period has expired, the completion of the proposal can only be done at the request of Vinnova.

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<sup>9</sup> Templates for the attachments, specific for this call by SIO Grafen, can be found on Vinnova's website: [Collaboration on commercial graphene applications - autumn 2023](#)

## **11 Who can read the proposal?**

Proposals submitted to Vinnova become public documents. Vinnova does not disclose information about an individual's business or operating conditions, inventions, and research results if it can be assumed that any individual will suffer harm if the information is disclosed.

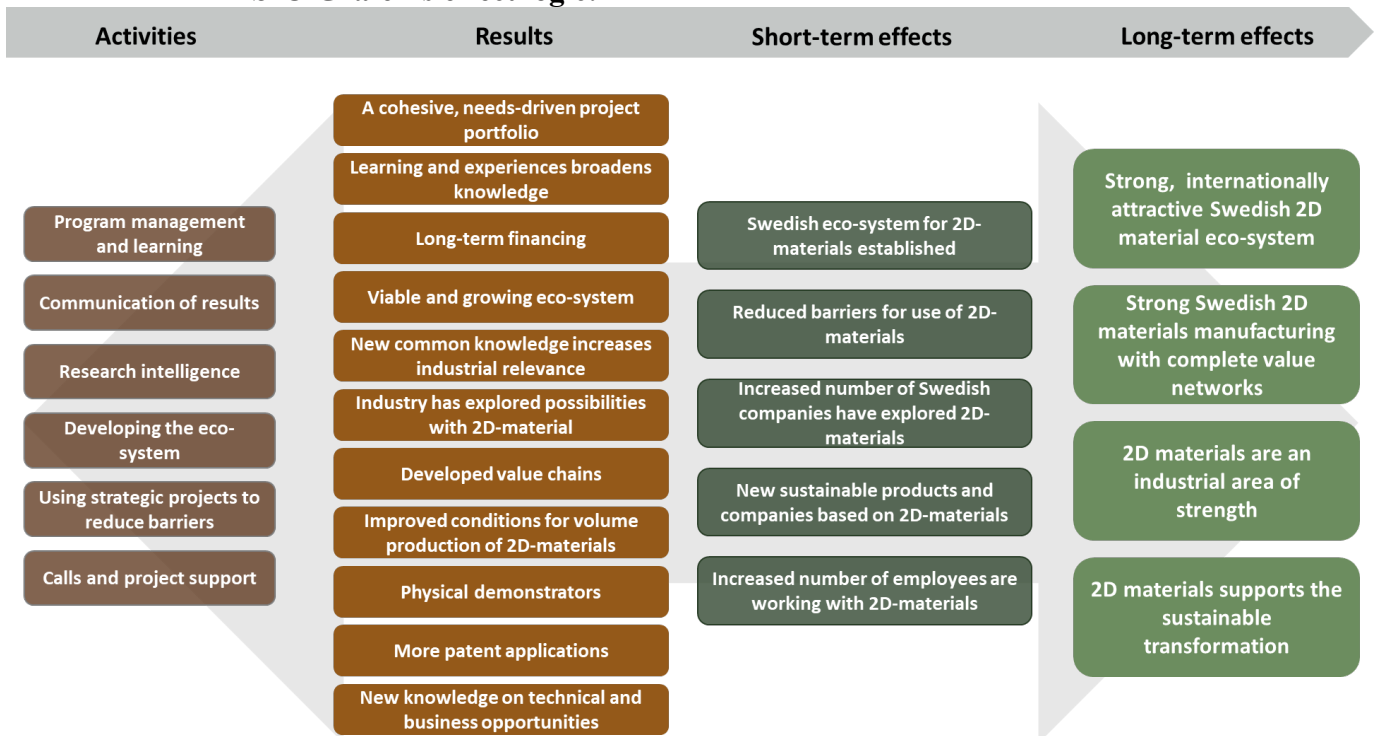
Documents sent to SIO Grafen's program office, for example the Project Summary, are not covered by Vinnova's confidentiality regulations.

## Appendix 1 – SIO Grafen’s goals and effect logic

### The vision of SIO Grafen:

SIO Grafen’ goal is that Sweden is one of the leading countries in the world in developing and using 2D materials industrially

### SIO Grafen’s effect logic:



## Appendix 2 – Definition of graphene and other 2D materials

In this call graphene and other 2D materials are defined as:

- One-layer graphene
- Few-layer graphene (FLG), that is material dominated by 2–10 atomic layers of graphitic carbon in a two-dimensional structure (sp<sup>2</sup>-hybridized).
- Graphene oxide, GO, or reduced graphene oxide, rGO, (the content is dominated of 1–10 atomic layers).
- 2D-materials (the content is dominated by 1–10 atomic layers) based on other species of atoms such as MoS<sub>2</sub>, WSe<sub>2</sub>, BN and so on.
- Functionalized materials based on any of the four categories above.

Not included in the call is graphite (over 10 atomic layers of carbon), carbon nano tubes and structures alike, neither surface coatings with diamond-like carbon (DLC).

Please contact the program office of SIO Grafen via [info@siografen.se](mailto:info@siografen.se) if you have any questions about graphene or other 2D materials.