VINNOVA
Sveriges innovationsmyndighet

CALL FOR PROPOSALS

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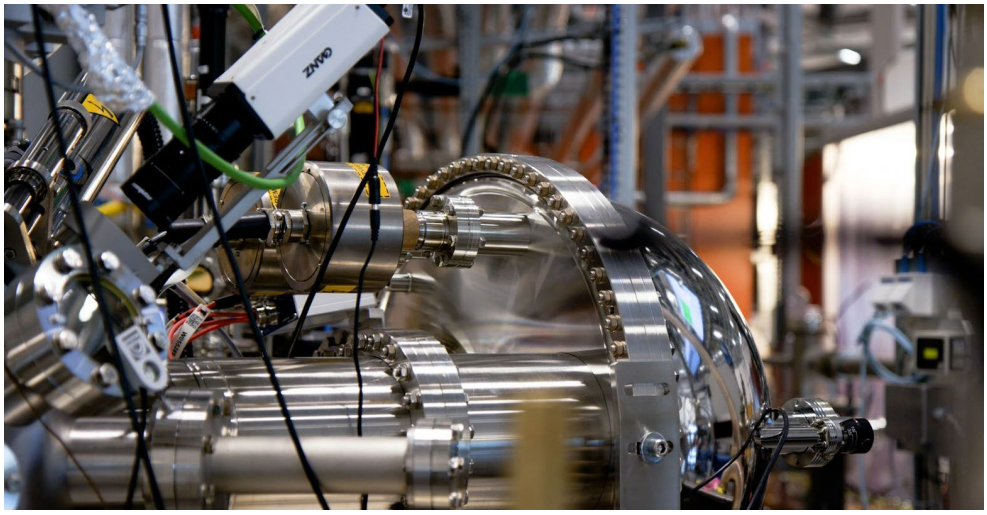

Development project for increased industrial utilization of neutron and synchrotron light-based technologies 2023

Funding to support building knowledge and capacity around industrial utilization of large-scale research infrastructure such as MAX IV and ESS

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Sveriges innovationsmyndighet

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Contents

If there are any uncertainties, please refer to the Swedish text.

Revision history

Date	

1 Summary

Vinnova works to strengthen the conditions for increased and broadened use of advanced research and innovation infrastructure.
This funding offer supports project initiatives that, through cross-organizational collaboration, build understanding, capabilities and capacity around the industrial exploitation of techniques and methods based on neutron scattering and synchrotron light.

The project proposal must be based on industrially relevant development needs and be able to result in long-term utilization of large-scale research infrastructure for the participating companies[1]. The project's stakeholder group must consist of:

- At least one project participant that is a Swedish[2] company that owns the development need that the project proposal addresses.
- At least one additional Swedish project participant that ensures expert competence regarding the neutron and/or synchrotron light-based technology.

The development efforts will be of a different nature in the projects that are funded, but all must carry out at least one well-motivated experiment at a neutron/synchrotron light facility.
This funding offer allows the use of all types of experiment time/beamtime offered by Swedish MAX IV as well as neutron and synchrotron light facilities outside of Sweden.

Each project proposal can apply for up to SEK 1,500,000 in grants and a maximum project duration of 24 months.
The project participants must themselves be responsible for at least 30 percent of the total eligible costs within the project.

A total of SEK 15 million has been set aside for project funding.

Important dates:
Proposals should be submitted to Vinnova by **September 12, 2023 at 14:00**
Decision date: November 1, 2023
Project start date: November 10, 2023

[1] Please note that only skill enhancement within a company does not constitute a sufficient development need. Participation to mainly coordinate and administer project management is not permitted.
[2] Swedish here also refers to foreign organizations that have a branch or place of business in Sweden, provided that project costs can be attributed to their operations.

For current information see the link: https://www.vinnova.se/en/calls-for-proposals/research-infrastructure-utilisation-and-collaboration/development-project-for-increased-2023-00268/

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2 What we want to accomplish?

World-leading research and development increasingly requires access to advanced large-scale research infrastructures.

The MAX IV laboratory in Lund is today one of the world's brightest research infrastructures for synchrotron light. In the same area, the European Spallation Source (ESS) is being built, which upon completion will be the world's most powerful neutron source.
Through the funding offer, Vinnova wants to contribute to increased competence and understanding of how analytical techniques based on neutron scattering and synchrotron light can respond to industrial and societal needs, such as development or improvement of new materials, drugs or industrial processes.

Neutrons and synchrotron light interact in different ways with a material and allow both comparable and complementary analyses based on diffraction, spectroscopy and various forms of imaging. For example, it is possible to study how different materials and biological structures are constructed, to map the chemical states of materials, and to follow different types of processes in real time. Provided that suitable sample environments (also called experimental environment) and methods have been developed and are available, time-resolved analyses can be carried out under realistic conditions (for example at different temperatures and pressures, in gases and liquids, or under mechanical loading). The possibility of in-situ and operando analyses under real manufacturing and operating conditions opens up ground-breaking developments for many industrial applications.

Even after completion, MAX IV and ESS will not be able to offer all types of experiments that can theoretically be performed at this type of research infrastructures. Facilities outside Sweden will constitute important complements. This financing offer therefore also funds projects that intend to carry out experiments with neutron and synchrotron light-based techniques at research facilities outside Sweden[3].

Vinnova is tasked with promoting sustainable growth by improving the conditions for innovation. Through our efforts, we strengthen the capacity to achieve the goals for sustainable development in Agenda 2030[4]. Since gender equality is a prerequisite for sustainable growth, this

[3] The Appendix of this document provides a number of non-limiting suggestions on where more information can be obtained regarding capacity and availability for experiments at MAX IV and various international facilities.
[4] More about the work to contribute to the goals in Agenda 2030: https://www.vinnova.se/en/m/the-2030-agenda--a-key-driver-of-innovation/

must permeate the work with all sustainability goals[5].
Results from research and innovation that are made freely available provide an increased opportunity for more people to contribute to solutions to societal challenges. The funding shall therefor contribute to more results being made freely available to everyone and scientific publication shall take place with open access.

3 To whom is this call for proposals directed?

This call for proposals is aimed at companies in collaboration with other companies, universities, research institutes, or other legal entities.

Only Swedish organizations can receive funding. This also includes foreign organizations with a branch or place of business in Sweden, provided that the project costs can be attributed to its operations

A non-Swedish organization can be a project participant if it finances its own costs and that there are eligible costs that can be reported to Vinnova.

Applicants who intend to carry out project activities in collaboration with an organization that is not a project participant must substantiate this extra resource allocation through a letter of intent from that resource-owning organization[6].

The project proposal must be based on industrially relevant development needs and be able to result in long-term utilization of large-scale research infrastructure for the participating companies[7]. It is assumed that expert competence is needed regarding the intended technology and its relevance to the industrial application. The project's stakeholder group must therefore consist of[8]:

- At least one project participant that is a Swedish company that owns the development need that the project proposal addresses.
- At least one additional Swedish project participant that ensures expert competence regarding the neutron and/or synchrotron light-based technology.

[5] Read more about what our work for equality innovation means for you who apply for grants from us (in Swedish only): https://www.vinnova.se/m/jamstalld-innovation/
[6] For example, collaboration with a research infrastructure, or synergies with projects that are financed in other ways and that do not have the opportunity to report project costs to Vinnova.
[7] Please note that only skill enhancement within a company does not constitute a sufficient development need. Participation to mainly coordinate and administer project management is not permitted.
[8] Swedish here also refers to foreign organizations that have a branch or place of business in Sweden, provided that project costs can be attributed to their operations.

4 What do we fund?

4.1 Activities which you can seek funding for

The funding aims to give companies understanding and own experience regarding the use of large-scale research infrastructure, as well as how companies can collaborate with both resource-owning and research and innovation-supporting organizations in various sub-stages of the process.

The projects' development efforts will be of different nature, but all granted projects must include the implementation of at least one well-motivated experiment at a neutron and/or synchrotron light facility. The applicants must also have identified a relevant experimental station/beamline as a solution hypothesis to meet the need.

In order to meet the purpose of the call for proposals, representatives from need-owning companies are expected to participate in the implementation of experiments at the research infrastructure and to be active also in the other work packages.

The following types of project activities are expected to be included to varying extents:

- Method selection, design and planning of experiments at the desired research infrastructure.
- Sample preparation and necessary sample characterization directly linked to the neutron/synchrotron experiment.
  The sample matrix must, however, be limited to meeting needs for verification/development of the usability of the method, and not be expanded to analyze properties of several different materials/sample types per se. If the project's challenge concerns quality assurance of performance, the production of test objects must take place outside the scope of the project. Extensive component production is thus not considered sample preparation.
- Verifying comparisons with already existing results from other analysis techniques or modeling.
  Please note, however, that conducting experiments with analytical techniques at regular laboratories, or modeling, only constitutes approved project costs if it can be clearly justified as necessary for experimental design or result interpretation.

Resources need to be set aside for sufficient results analysis to be able to draw conclusions from analysis data and how the results can be taken forward after the project.

The project proposals may include development efforts to be able to better carry out industry-relevant experiments or utilize measurement results from industry-relevant samples. In these cases, however, the project proposal must both justify the news value and describe how the resulting solutions will be handled after the end of the project regarding, for the purpose, relevant aspects of interoperability and making it available to users outside the project group as well.

To justify the need for the capacity of a large-scale research infrastructure for neutron scattering or synchrotron light, the proposal must describe limitations with analytical techniques that are available in a regular laboratory environment.

To justify the feasibility of the project, the proposal must describe preliminary work already carried out in, for example, a regular laboratory environment. Where relevant, the proposal should have been preceded by feasibility studies to substantiate the technical feasibility of the experiments. If applicants plan, for example, experiments in situ/operandum, then one should be able to refer to already verified performance for ex situ measurements on the corresponding sample type.

To be able to carry out experiments and other development activities at a research infrastructure for synchrotron light or neutron scattering, the project needs to be granted access by the respective research infrastructure. Access is called experimental time (also beamtime) and is distributed mainly based on scientific excellence (so-called "peer review access") through open calls. In these cases, the experiments are carried out free of charge, but results need to be published [9]. Access can often also be granted for experiments that the users themselves pay for (so-called "proprietary access"). In that case, the research infrastructure allows confidentiality, but note that Vinnova's funding nevertheless conditions that certain information is made available for free publication.

It is important that the projects that are granted funding are made visible and can inspire others. In connection with the final report to Vinnova, an easily accessible description according toa template[10] must be attached for free publication and distribution (see section 8.2).

Experiment time does not have to be formally granted or scheduled by a research infrastructure when the proposal is submitted to Vinnova. However, the applicant must justify both technical and time related feasibility where the following applies:

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[9] There may also be different regulations regarding IPR issues that should be sorted out before the facility is seen as a possible resource in the application.
[10] For examples, see attached pdf-files in list of "Granted industrial pilot projects": https://www.vinnova.se/en/m/sustainable-industry/large-scale-research-infrastructure/industrial-utlilisation-MAX-IV-and-ESS/

- Applicants who intend to obtain experimental time through **open calls** at a research infrastructure must explain what measures can be taken to enable the project to be carried out if no free time is granted.
- Applicants who intend to use **paid** experimental time are expected to refer to an already completed dialogue with the intended research infrastructure that confirms that the planned arrangement regarding payment is feasible[11], and that the desired experimental station is possible to gain access to during the project period.

The project duration of a maximum of 24 months must be reasonable in relation to what is to be carried out in the project.

4.2 Eligible costs

Vinnova's funding is through grants and is subject to certain regulations. These regulations control, among other things, the types of costs of the project participants that may be covered by grants. Grants will be awarded in accordance with Sec 9 of the Ordinance (2015:208) on research, development and innovation, i.e. as aid to research and development projects under article 25 of the Commission Regulation (EU) No 651/2014 (GBER). The types of project activities approved in this call for proposals shall be covered by **Industrial research** (Industriell forskning) as basis for support. Eligible costs are shown in the "Vinnova's general terms and conditions for grants"[12] and are described in more detail in the "Instruction to eligible costs"[13].

As general conditions for a cost to be eligible, it shall:

- be actual and verifiable,
- be incurred by a project participant,
- be reasonable and incurred for the sole purpose of carrying out the project,
- have been incurred during the project time,
- be recorded and established in accordance with the participant's usual and generally accepted accounting principles, and
- be in line with the participant's internal policies and guidelines.

[11] Different rules may apply to paid experimental time/beamtime at different facilities. This may apply to planned price increases, if an experimental station allows paid beamtime at all, or if the facility has requirements on which type of organization is billed. Regarding price information, applicants should ensure whether "moms" (VAT) etc. is included, as well as for the corresponding international invoicing how VAT is handled (contact the Swedish Tax Agency for correct information, also regarding the country of taxation).
[12] For current General terms and conditions for several project parties as well as help to understand and fulfill them see: https://www.vinnova.se/en/apply-for-funding/rules-for-our-funding/terms-and-conditions-for-our-funding/
[13] See: https://www.vinnova.se/globalassets/huvudsajt/sok-finansiering/regler-och-villkor/dokument/2023-instruction-to-eligible-costs-eng.pdf

Costs for subcontractors/consultants are eligible provided that activity and magnitude are stated in the project description.

The offer allows use of MAX IV as well as international research infrastructure for neutron and synchrotron-based technologies.

- Travel expenses and costs for beamtime/experiment time shall be reasonable and appropriate.
- It is possible to use all types of experimental time/beamtime that are permitted at the current facility and experimental time/ beamtime is an eligible cost for subcontractors/consultants. However, special rules apply to projects that refer to paid beamtime at MAX IV if Lund University is a project participant, see section 8.2.

No project activities may be started before the project start date.

5 What size grant do we fund?

Each project proposal can apply for up to SEK 1,500,000 in grants.
The project participants must themselves be responsible for at least 30 percent of the total eligible costs within the project.

The following applies if an organization that carries out economic activities (here: company) intends to apply for a grant from Vinnova:
According to the rules on state aid, this grant can only constitute a certain percentage of the company's total eligible cost in the project[14]. Remaining eligible costs must be financed by the company itself.

By means of eligible certificate, this call for proposals also permits funding in agreement with the De Minimis Aid Regulation (also known as 'negligible aid')[15].

Grants may also be awarded to public entities participating with their non-economic activities which are not subject to state aid rules. Grants to such entities will be awarded in accordance with the Ordinance (2009:1101) with Instruction to the Swedish Innovation Agency. This applies also to research organisations (universities, higher-education establishments and institutes) when they participate with non-economic activities.

[14] See: https://www.vinnova.se/en/apply-for-funding/rules-for-our-funding/state-aid-to-companies/
[15] For more information on the De Minimis aid, as well as the download of the mandatory certificate, see: https://www.vinnova.se/en/apply-for-funding/rules-for-our-funding/state-aid-to-companies/

Each project participant is responsible for ensuring that the grant received does not exceed the level of aid permitted under state aid rules.

6 Conditions for us to assess the proposal

Vinnova will only assess proposals that meet the following formal requirements:

- ✓ All project participants are legal entities.
- ✓ All project participants that seek grants from Vinnova are Swedish organizations[16].
- ✓ The project consortium consists of at least two project participants, of which at least one Swedish company[17] and at least one additional Swedish organization responsible for expertise in current synchrotron or neutron-based technology
- ✓ Intended expertise is already employed by a project participant responsible for expertise when the proposal is submitted[18].
- ✓ The proposal follows the instructions in section 9 and contains all the mandatory attachments requested there.

7 Assessment of proposals received

7.1 What do we assess?

Only the written content of the submitted proposal will be assessed (no links or other references). What is assessed is to which degree the project proposals meet each of the three main criteria of Potential, Feasibility and Participants.
The bulleted list below indicates what contributes positively to the assessment.

Potential

- The project activities are in line with the purpose of the funding offer (according to sections 3 and 4). The project result and the company's long-term utilization of experiments based on neutron scattering or synchrotron light have the potential to contribute to economic, environmental and socially sustainable societal development.

[16] Swedish organizations also mean foreign organizations that have a branch or place of business in Sweden, provided that the costs in the project are attributable to the operations of the branch/place of business.
[17] In this context, the term "company" does not mean incorporated research institutes or companies that do not themselves own the development needs that the project intends to meet.
[18] We do not allow project employment, or the equivalent, as a result of received financial support.

- Relevant and necessary preliminary work is described, and it is clear what added value experiments based on neutron scattering or synchrotron light are expected to bring beyond what can be achieved in regular laboratories.
- Any project results of a method- and equipment-related nature are handled well with regard to, for the purpose, relevant aspects of news value, interoperability and making them available outside the project group as well.

Feasibility

- The project proposal's activities and time plan are reasonable in terms of available resources.
- The project consortium motivates in a credible way that the desired experiment is technically feasible and possible to implement in time at a relevant experimental station.
- Other relevant risks associated with implementation and resources are managed in an appropriate and credible manner.

Participants

- The project's stakeholder group is purposefully composed in terms of roles, competencies and time commitment.
  Any imbalance in the gender distribution, including commitment and influence, is explained credibly and in a way specific to the project proposal.
- The need-owning company/ies intend to participate in experiments at the large-scale research infrastructure, and the project participants actively collaborate within other work packages as well.

7.2 How do we assess the proposals?

The proposals that meet the formal requirements (see section 6) will be assessed by external assessors chosen and appointed by Vinnova. This results in a recommendation for funding to Vinnova.

Vinnova's decision on funding will be based on the external assessors' recommendation and that Vinnova can apply a portfolio perspective. This means that within the available budget, Vinnova may prioritize recommended proposals that address application areas where we have funded fewer projects so far within Vinnova's call for proposals series for industrial pilot- and development projects since 2018[19].

[19] List of "Granted industrial pilot projects" in various application areas can be found here: https://www.vinnova.se/en/m/sustainable-industry/large-scale-research-infrastructure/industrial-utlilisation-MAX-IV-and-ESS/

Proposals that do not meet the formal requirements will be rejected without further justification.

8 Decisions and conditions

8.1 About our decisions

How much each project participant is granted is stated in the decision. The decision also states the basis for support (stödgrund) which also governs which costs are eligible for support.

Vinnova's decision to grant or refuse a proposal cannot be appealed.

8.2 Terms and conditions for awarded grants

Vinnova's general terms and conditions for grants apply to the awarded grants[20]. These conditions include rules on project agreements, prerequisites for payment, followup, reporting and utilisation of results. Scientific publication shall take place with open access in accordance with Vinnova's instructions[21].

The following special terms and conditions apply to the grants awarded in this call:

- In connection with final reporting to Vinnova, an easily accessible one-page description of the purpose, development steps, sample preparation, experimental station/method and project results must be enclosed for open publication and dissemination. A representative from the company must be mentioned as a contact person. A template for this is distributed by Vinnova.

Additional special terms and conditions may be decided for individual projects:

If you do not comply with Vinnova's terms, you may be liable to repay the grant. This is also true if you have been granted an incorrect or excessive amount of funds.

[20] Current General terms and conditions can be found on our website, along with help to understand and meet the terms: https://www.vinnova.se/en/apply-for-funding/rules-for-our-funding/terms-and-conditions-for-our-funding/
[21] See: https://www.vinnova.se/globalassets/huvudsajt/sok-finansiering/regler-och-villkor/dokument/anvisning-for-oppen-tillgang-till-vetenskapliga-publikationer.pdf (in Swedish only)

The following special terms and conditions only apply to projects that intend to use MAX IV through paid beamtime and where Lund University itself is a project participant.
If Lund University is a project participant, a project participant other than Lund University can bear costs (be invoiced) for beamtime at MAX IV as follows:

- By way of deviation from the second paragraph of §2 in the general terms and conditions, the project participant may purchase beamtime from Lund university/MAX IV according to the rates applied by MAX IV. The cost is taken up and reported under Consulting costs.

If Lund University, as a project participant, itself budgets for paid beamtime at MAX IV, the following applies:

- As an eligible cost for Lunds universitet regarding beamtime at MAX IV, cost is accepted according to the cost model that MAX IV normally applies internally. The cost must be taken up and reported under Other direct costs.

9 How to apply

To apply for funding, you fill in the web-based form in Vinnova's eService. You also have to upload the following **mandatory attachments according to templates** downloaded from the web page of the call for proposals: https://www.vinnova.se/en/calls-for-proposals/research-infrastructure-utilisation-and-collaboration/development-project-for-increased-2023-00268/
The documents must be written with twelve (12) point normal black text.

Please note that the proposal will be assessed by international non-Swedish speaking evaluators. **Our strong recommendation is therefore that the proposal is written in English**. If the proposal is written in Swedish, it will be translated without your co-operation.

Three mandatory attachments:

- **Project description:** May consist of maximum six (6) standing A4 pages.
- **CV- Appendix:** Shall include relevant information for the project regarding key persons from all project participants and, when relevant, also include resources in consultant roles.
- **Letter of Intent:** Shall be attached from needs-owning companies amongst the project participants and shall motivate the development need in accordance with the purpose of the funding offer. It shall be signed by a person qualified to sign contracts for research- and innovation projects on behalf of the organisation concerned.

For project participants applying for grants in accordance with the regulation on support of minor importance (de Minimis regulation), the certificate for this is attached under **Övriga bilagor** (eng: Other appendices).

If resources that cannot report costs to Vinnova intend to support the project, then this resource allocation is expected to be substantiated by a letter of support from the organization concerned under **Övriga bilagor** (eng: Other appendices).

No additional material may be attached to the proposal.

Proposals must be submitted to Vinnova through the eService at latest September 12, 2023, at 14:00.
When the proposal period has expired, any complementary of the proposal can only be made at the request of Vinnova.

10 Who can read the proposal?

The proposal can be read by Vinnova's staff as well as by the external assessors appointed by Vinnova within this call for proposals. All work under a duty of confidentiality.

Proposals submitted to Vinnova become public documents, but Vinnova does not disclose information about the individual's business or operational conditions, inventions and research results if it can be assumed that any individual suffers

Appendix

Altogether, a comprehensive portfolio of advanced experiments is enabled at MAX IV and international large-scale research infrastructure for neutron scattering and synchrotron light.

The potential of MAX IV[22] is particularly large for experiments that depend on high brilliance and coherence during analysis. This opens for new opportunities regarding e.g. imaging of unstructured materials within materials research and life sciences.

Through the Swedish Research Council, Sweden also finances the experimental station "Swedish materials science beamline (SMS P21.2 Diffraction & Imaging) at the German synchrotron Petra III at DESY in Hamburg[23]. Petra III operates at photon energies that complement what is possible to perform at MAX IV, and SMS P21 is dedicated to diffraction and imaging (P21.2) as well as wide-angle diffraction (P21.2). SMS P21 is administered by KTH, Linköping University and DESY through the centrum CeXS[24]. The agreement with DESY also include some priority access for Swedish users at all beamlines at Petra III that are administrated by DESY themselves.
The Swedish Research Council also finances the Swedish membership in the European synchrotron ESRF [25] in France, which after two years of upgrading to the 4th generation synchrotron (for hard X-rays) has reopened for use. The Swedish Research Council also finances the Swedish membership in the ILL neutron source[26] in France. At ILL they also co-finances the reflectometer "Super ADAM" which is administered by Uppsala University[27]. The Swedish Research Council also contributes to operating costs of the neutron source ISIS[28] in England.

Detailed information on the capacity and availability of individual facilities in different locations in the world is provided through their respective websites. There are also a few collaborative initiatives between European research infrastructures and information is for instance provided on the platforms of WayForLight.eu, Lightsources.org and Neutronsources.org.
Many facilities have user offices that offer special support for industry and can answer if any of their experimental stations and instruments is suitable for what is desired.

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[22] https://www.maxiv.lu.se/industry/
[23] Petra III at Deutsches Elektronen-Synchrotron (DESY) Hamburg, Tyskland
[24] Läs mer på https://www.cexs.kth.se/svRead more at https://www.cexs.kth.se/sv
[25] European Synchrotron Radiation Facility (ESRF), Grenoble, Frankrike.
[26] Institut Laue-Langevin (ILL), Grenoble, Frankrike
[27] See https://www.physics.uu.se/research/materials-physics+/super-adam/
[28] ISIS Neutron and Muon Source (ISIS) Oxford, England.