VINNOVA
Sveriges innovationsmyndighet

**CALL FOR PROPOSALS**

*Date*
01-03-2021
*Revied by*

*Journal number*
2021-01158

# Industrial utilization of technologies based on neutron and synchrotron light at large-scale research infrastructures

# Pilot and Development projects 2021

A call for proposals for strengthened collaboration and skills development around industrial utilization of large-scale research infrastructure such as MAX IV and ESS

VINNOVA
Sveriges innovationsmyndighet

# CALL FOR PROPOSALS

*Date* 01-03-2021
*Revied by*

*Journal number* 2021-01158

## Contents



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

### Revision history

| **Date** | |
|---|---|
| | |

# 1 Summary

Through the funding, Vinnova wants to strengthen the conditions for industrial use of technologies based on neutron scattering and synchrotron light at large-scale research infrastructures.
Granted project shall build on the development needs and potential for long-term utilization of Swedish companies, of which at least one must be participant.

All project proposals must include the implementation of at least one experiment at an already identified experiment station/beamline at a facility for neutron scattering or synchrotron light. At least one additional Swedish project participant must therefore ensure expert competence regarding the intended analysis technology as well as regarding its relevance for the industrial application.

Experiments are allowed at MAX IV as well as at any international large-scale research infrastructure for technologies based on synchrotron light or neutron scattering. All types of access for experimental time/beam time are allowed in this call for proposals and beam time is an eligible cost.

Up to SEK 15 million is available for projects addressing two different sub-offers:

**A) Pilot project**

- Each Pilot project can apply for up to SEK 500,000 in funding for a maximum project time of 18 months. For Pilot projects, there are no overall eligibility requirements for the share of own funding of the project's total budget.
- The project activities shall aim to verify the added value for the company's needs in addition to what can be obtained with analytical tools available in a regular laboratory environment.
- Pilot projects aim to give companies a first-time experience of using a large-scale research infrastructure. Please note that the offer **cannot** be applied for by a company that has previously received corresponding funding from Vinnova.

**B) Development project**

- A development project can apply for up to SEK 1 500 000 in funding for a maximum project time of 24 months. Participating project partners must assist with at least 30 percent of own funding of the total project cost.
- The project activities shall meet development needs where the importance of using large-scale research infrastructure already has been confirmed for the company, but it is judged that additional values could be verified through advanced experiments at an identified experimental station/ beamline.

**Important dates:**
Proposals should be submitted to Vinnova by **21 September 2021 at 14:00**
Decision date: 10 November 2021
Project start date: 15 November 2021

**Questions on the contents:**
Maria Öhman, Call responsible program manager
08-473 3189
maria.ohman@vinnova.se

**Administrative questions:**
Sussi Trankell
08 473 3158
sussi.trankell@vinnova.se

**Contact regarding the eService's portal (Intressentportalen)**
Vinnova's IT-support
08-473 32 99
helpdesk@vinnova.se

**Link to the call for proposals website:** https://www.vinnova.se/en/calls-for-proposals/research-infrastructure-utilisation-and-collaboration/industrial-utilization-of-neutron-and-2021-01158/

# 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 one of the world's brightest sources for synchrotron radiation and is Sweden's largest research infrastructure investment. In the same area, the European Spallation Source (ESS) is being built to become the world's strongest neutron source. Through the funding offer, Vinnova wants to contribute to increased competence and understanding of how the use of these unique experimental environments 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 in 2D and 3D. In all, the techniques allow for an extensive portfolio of analytical possibilities. 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 a desired sample environment (also called experimental environment) is in place, time-resolved analyses can be performed in realistic conditions for different industrial applications, for example at different temperatures and pressures, in gases and liquids, or under different forms of mechanical stress. The possibility of in-situ and operando analyses under real manufacturing and operating conditions opens up for pioneering development for many industrial applications.

Even after completion, MAX IV and ESS will not be able to offer all types of experiments. International facilities will thus be important complements also in the future. This call for proposals therefore also funds projects that aim to conduct experiments at large-scale research infrastructures for techniques based on neutron and synchrotron light outside Sweden[1].

Vinnova is tasked with promoting sustainable growth by increasing the innovation capacity. Through our efforts, we strengthen the capacity to achieve the goals for sustainable development in Agenda 2030[2] and contribute to the global commitment. Since gender equality is a prerequisite for sustainable growth, this must permeate the work with all sustainability goals[3].

[1] The Appendix of this document provides a few suggestions on where more information can be obtained concerning the capacity and availability of MAX IV and various international facilities
[2] Read more (in Swedish only): https://www.vinnova.se/m/agenda-2030/
[3] 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/

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 call for proposals shall 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, academia, research institutes, or other legal entities.

Only Swedish organizations can receive funding in this call for proposals. Swedish organizations also mean foreign organizations that have a branch or establishment in Sweden. However, the costs in the project must be attributable to the activities of that branch or establishment.
A non-Swedish organization can be a project partner if it finances its own costs and that there are eligible costs that can be reported to Vinnova.

# 4 What do we fund?

## 4.1 Activities which you can seek funding for

**The following applies to all project proposals:**

The concept on which the proposal is based must be based on development needs of a company and be able to result in long-term utilization of large-scale research infrastructure for the company[4].

The proposal must include planning and implementation of an experiment at an already identified experimental station/beamline at a neutron or synchrotron light facility, as well as a sufficient results analysis to enable conclusions about the added value of the experiment and planning for how the results can be utilized after the project.
This is assumed to require expert competence in both the intended analysis technology and the relevance for the industrial application area.

[4] Please note that solely enhancing the skills within a company does not constitute an enough need in this context. Participation to mainly coordinate and administer project management is also not allowed.

The project stakeholder group must therefore consist of at least two project participants:

- At least one project participant must be a Swedish company[5] that owns the development needs that the proposal addresses.
- At least one additional Swedish project participant shall ensure expert competence regarding the analytical technology and its relevance for the industrial application.

Experiments are allowed at MAX IV as well as at any international large-scale research infrastructure for neutron or synchrotron-based techniques.
This call for proposals allows all types of experimental time allowed at the facility and experiment time/beam time is an eligible cost.

To justify the need for the capacity of large-scale research infrastructures, the proposal shall describe already performed preparatory work as well as limitations with relevant analysis techniques that are available in regular laboratories. Implementation of experiments with laboratory-based techniques and modelling is thus expected to have already been completed and are only approved as project activities if sample characterization can be clearly justified as necessary for the experimental design or interpretation of results from the experiments.
Also sample production and sample preparation constitute eligible costs. The sample matrix shall however be limited to verifying the usefulness of the method and not be expanded in order to, for example, ensure properties of several different materials/sample types per se.
The proposal may also include some modification and adaptation of the analysis method or sample environment to allow realistic industrial conditions at the experimental station.

To meet the purpose of the call for proposals, it is expected that representatives from need-owning company/ies participates in the implementation of experiments at the research infrastructure.

It is important that the pilot projects granted funding can be displayed and inspire others. In connection with final reporting to Vinnova, a short description according to template must therefore be enclosed for free publication and dissemination (see section 8.2.).

[5] Swedish organizations also mean foreign organizations that have a branch or an office in Sweden. However, the costs in the project must be attributable to the activities of the branch or the establishment.

In addition to the above, the following applies to the respective sub-offer A and B:

**A) Pilot project**

Each Pilot project can apply for a maximum grant of SEK 500.000 for a project period of maximum 18 months.

A main project goal should be to demonstrate added value with neutron and/or synchrotron light-based technologies that are new to the company and cannot be achieved in regular laboratories.

Pilot projects aim to give companies a first-time experience of using large-scale research infrastructures. Therefore, the offer **cannot** be applied for by a company that has previously received corresponding funding for Pilot projects (formerly also called Pilot experiments) from Vinnova[6]. It also follows that a company can only be the primarily needs-owning company in one proposal for Pilot projects within this call for proposals[7].

**B) Development project**

Each Development project can apply for a maximum grant of SEK 1.500.000 and the project participants must contribute at least 30 percent of the total eligible project cost as own funding.

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

The proposal expects to be able to justify how the project result raises the company's existing level of knowledge about the use of large-scale research infrastructure. The project activities shall meet development needs where the importance of using large-scale research infrastructure has already been confirmed for the company, but methodological added values is judged to be possible to verify through advanced experiments at identified experimental stations.

It is also considered positive if project results can provide added value for actors outside the project group, for example by being able to verify the performance of an existing experimental environment or method at the experiment station through the project group's activities.

---

[6] For information regarding any previous involvement in the Pilot Experiment / Pilot project, contact the call responsible program manager at Vinnova.
[7] A company that has previously received a Pilot Experiment / Pilot project can still be included as a project participant but cannot hold the role as primarily needs-owning company.

Provided the resulting solution has news value and can be made available to others, the proposal can also include some modification and adaptation of an analysis method, sample environment, or method for data processing to allow improved industrial conditions at the experiment station as well as resource efficient data reduction and visualization of the results to better utilize the value of the industrially relevant experimental data.

**The following applies to all project proposals:**

To be able to carry out experiments and other development activities at a large-scale research infrastructure for techniques based on neutrons or synchrotron light, access needs to be approved. This is called experiment time (also beam time) and is distributed by the respective research infrastructure above all through open calls for proposals based on scientific excellence ("peer review access"). These experiments are performed free of charge, but results need to be published and the call for proposals are often carried out only every six months.
Many large-scale research facilities also allow access for experimental time that the users themselves pay for ("proprietary access"). This allows for confidentiality from the research infrastructure, but please note that Vinnova's funding still conditions that certain information be made available for open publication after the end of the project.

Experimental time does not need to be formally approved or fixed in time by a research infrastructure when the proposal is submitted to Vinnova. However, the project consortium shall be able to motivate in the proposal how the experiment is judged to be technically feasible and possible to carry out during the project time.
**Proposers that intend to seek access through open calls** of a research infrastructure is expected to describe what measures can be taken to enable implementation of the project if no free access is granted at the experimental station intended.
Also note that different rules may apply to paid experiment/beamtime at different facilities[8]. **Proposers who intend to use paid beamtime** are therefore expected to refer to a completed dialogue with a named research infrastructure that confirms that the planned arrangement is feasible if the proposal is granted funding from Vinnova and that the experimental station of choice is possible to schedule during the project period.

If additional personnel and financial resources are available for essential activities but for various reasons cannot be reported to Vinnova, this resource allocation is

[8] This can apply to upcoming increase of costs, if an experimental station at all allows for paid beamtim, or if the facility has certain requirements regarding which type of organization that is invoiced. There may also be different regulations regarding IPR issues that should be clarified before the facility is considered a possible resource in the proposal.

expected to be described in the project plan and also substantiated by a letter of support [9].

### 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 partners that may be covered by grants. The types of project activities approved in this call for proposals shall be covered by GBER art. 25 for Research and Development, with **Industrial research** (Industriell forskning) as basis for support.
Eligible costs are shown in the "Vinnova's general terms and conditions for grants"[10] and are described in more detail in the "Instruction to eligible costs"[11].

Costs for subcontractors/consultants may only be used to the extent specified in the project description. For instance, eligible costs that occur at a research infrastructure whose organizational domicile is **not** project participant can be accounted for as consultancy costs for a project participant.
Travel expenses and costs for beamtime/experiment time shall be reasonable and appropriate.

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

## 5 What size grant do we fund?

A proposal for Pilot project can apply for up to SEK 500,000 in funding.
For Pilot projects there are no overall requirements regarding share of own funding of the project's total eligible costs.

A proposal for Development project can apply for up to SEK 1 500,000 in funding. The project participants must account for at least 30 percent of the total eligible costs within the project.

**If** an organisation/project participant that carries out economic activities (hereinafter "company") intend to seek grant from Vinnova, the state aid rules

[9] For instance, the collaboration with a research infrastructure (such as friendly beam time, support), synergies with already ongoing projects or organizations that are not project participants.
[10] Current 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/
[11] See: https://www.vinnova.se/globalassets/huvudsajt/sok-finansiering/regler-och-villkor/dokument/20201201-anvisning-till-villkor_om_stodberattigande_kostnader_-_guide.docx-.pdf (in Swedish only).

limits this to a certain proportion of the company's total eligible cost in the project[12]. The remaining 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')[13].

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[14].
- ✓ The project consortium consists of at least two project participants, of which at least one is a Swedish company[15] and at least one different Swedish organization provides expertise regarding the synchrotron/neutron-based technology addressed.
- ✓ The proposal follows the instructions in section 9 and contains all the mandatory attachments requested there.

- ✓ For Pilot projects: The needs owning company confirms in the intended box of the project description that no previous funding for Pilot projects (previously also called Pilot experiments) has been granted[16].

[12] See: https://www.vinnova.se/en/apply-for-funding/rules-for-our-funding/state-aid-to-companies/
[13] 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/
[14] Swedish organizations also mean foreign organizations that have a branch or an office in Sweden. However, the costs in the project must be attributable to the activities of the branch or the establishment.
[15] In this context, the term "company" does not apply to incorporated research institutes, or companies that do not themselves own the development needs that the project intends to meet.
[16] If a company needs information regarding previous engagement in Pilot projects/experiments, please contact the responsibly program manager at Vinnova.

# 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 aim of the funding offer and the sub-offer of choice according to section 4.1 and can result in long-term utilization of large-scale research infrastructures for the company.
- Relevant preparatory work is described and it is clear what added value the experiment based on neutron scattering or synchrotron light is expected to bring in addition to what can be achieved in regular laboratories.
- The proposal clarifies collaboration and knowledge transfer within the project consortium and the project results have potential to contribute to financial, environmental and socially sustainable societal development.
- **For Development projects:** The project result has the potential to contribute to long-term utilization outside the project group.

**Feasibility**

- The project activities and time schedule are reasonable with respect to the 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 consortium is appropriately composed with respect to project goals and implementation. A possible imbalance in gender distribution, including commitment and influence, is explained in a credible and specific way.
- The need-owning company participates actively in the work packages that address the use of large-scale research infrastructure.

### 7.2 How do we assess the proposals?

The proposals that meet the formal requirements (see section 6) will be assessed according to the assessment criteria by external assessors chosen and appointed by Vinnova. This results in a recommendation for funding to Vinnova.
Proposals that do not meet the formal requirements will be rejected without further justification.

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, or with respect to techniques that have been used to a lesser extent[17]. For Development projects also the need-owning company is taken into account.

## 8 Decisions and conditions

### 8.1 About our decisions

The granted amount to each project participant is stated in the grant decision. Vinnova's grants is awarded with support from the rules stated in SFS 2015:208 or with support from the De Minimis regulation, EU no 1407/201 (also known as negligible aid). The aid foundation is set out in the grant decision and governs the eligibility of costs.

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

### 8.2 Terms and conditions for awarded grants

Vinnova's general conditions for grants apply to the awarded grants[18]. 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.

---

[17] If a company needs information regarding previous engagement in Pilot projects/experiments, please contact the responsibly program manager at Vinnova. Lists of already funded pilot experiments in various fields of application can also be found here: https://www.vinnova.se/en/m/large-scale-research-infrastructures/industrial-utlilisation-MAX-IVand-ESS/

[18] Current 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/

The following special 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, participating actors and overall description of sample preparation, choice of experimental station/method as well as project results/development must be enclosed for open publication and dissemination. A representative from the company must also be mentioned as a contact person. A template for this is distributed by Vinnova.

Additional special 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.

# 9 How to apply

To apply for funding, you fill in the web-based form in Vinnova's eService's portal (Intressentportal). You also have to upload the following mandatory attachments **according to templates** downloaded from the web page of the call for proposals[19]. The documents must be written with twelve (12) point normal black text.

Please note that the proposal will be assessed by both Swedish and 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 five (5) standing A4 pages.
- **CV- Appendix:** Shall include relevant information regarding key persons from all project participants and, when relevant, also include resources in consultant roles.
- **Letter of Intent:** Shall be attached from a needs-owning company 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.

[19] Here you find templates for the mandatory attachments: https://www.vinnova.se/en/apply-for-funding/rules-for-our-funding/terms-and-conditions-for-our-funding/

If an organisation intends to seek support according to the “de Minimis regulation”, the certificate for this shall be attached as **Övrig bilaga** (eng. Additional Appendix).

If resources that are not to report costs to Vinnova intend to contribute to the project, then this resource allocation is expected to be substantiated by the organisation concerned as **Övrig bilaga.**

No additional material may be attached to the proposal.

Proposals must be submitted to Vinnova through the eService’s portal (Intressentportalen) at latest September 21 2021, 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?

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 damage if the information is divulged.

## Appendix. Guide to large-scale research infrastructures

Detailed information on the capacity and availability of individual facilities can be 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.
Most facilities also 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.

In all, a comprehensive portfolio of advanced experiments is permitted at MAX IV and the international large-scale research infrastructures for neutron scattering and synchrotron light.

The potential of MAX IV 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. For more information regarding the capacity and performance of MAX IV, see https://www.maxiv.lu.se/users/

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[20]. 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[21]. 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 [22] 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[23] in France. At ILL they also co-finances the reflectometer "Super ADAM" which is administered by Uppsala University[24]. The Swedish Research Council also contributes to operating costs of the neutron source ISIS[25] in England.

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