

# Quantum Step-Up 2022

A call within Vinnova's area Ecosystems for innovative companies

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## Revisions

Date	Change

## 1 Offer in brief

The purpose and goal of the call Quantum Step-Up 2022 is to stimulate and support innovative projects from small and medium enterprises for commercialization of quantum technology.

Quantum technology is entering broader commercialization. Sweden has established a research center for quantum technology, WACQT. Internationally, many research and commercial initiatives are taking place in this area.

A preceding call from Vinnova has confirmed the motivation for government stimulus and the injection of innovation capital regarding quantum innovation for commercialization. That's why we're launching the initiative Quantum Step-Up 2022 in order to stimulate further novel innovative quantum technological solutions with aim for commercialization from small and medium enterprises.

In this call, the concept of quantum technology solutions is intended to be interpreted as “technologies for the dynamic control and manipulation of superposition and entanglement of quantum mechanical states, applied in solutions to meet customer demand”.

This call addresses projects which:

- employ quantum technology for pioneering commercial innovation
- aim to validate or verify customer value, product, business model, service or concepts (minimum viable solution)
- attract scaled financing from e.g. validated private investors and commercial partners, or to apply to EU calls
- execute within any application area for quantum technology, for example; metrology, simulation, modelling, communication, computing and algorithms, or other enabling technology solutions dedicated to quantum technology

The funding from Vinnova amounts max to one million SEK per project.

### **The following dates apply to the call:**

Please note that the dates are preliminary. For up-to-date information see [Quantum Step-Up 2022 | Vinnova](#)

Opening date	July 1, 2022
Application deadline	October 4, 2022, <b>at 14:00</b>
Last decision date	November 15, 2022

Project start no earlier than November 15, 2022  
Project start no later than November 22, 2022

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Up-to-date information about the call and link to the Vinnova portal for applications, Intressentportalen, can be found at [www.vinnova.se](http://www.vinnova.se).

## **2 What do we want to achieve with our funding?**

### **2.1 Background for the call**

Vinnova's previous call Quantum Kick-Start 2021 was intended to test the entrepreneurial market by offering finance for innovation projects. This previous effort granted seven projects expected to test the investor market, alert the innovation system, as well as create national attention with the further potential for international collaborations in innovation and commercialization.

The call Quantum Step-Up 2022 intends to further mobilize entrepreneurial and intermediary markets by the funding of additional innovation projects.

Vinnova views this effort as a continued stimulus of the entrepreneurial market, and that expected granted projects further test and stimulate investor and customer markets, expected to create a project portfolio with potential to include success stories.

Sweden has established a research center for quantum technologies, WACQT<sup>1</sup>. Major global nations and regions of innovation have announced substantial initiatives for quantum technologies; UK<sup>2</sup>, USA<sup>3</sup>, China<sup>4</sup>, EU<sup>5</sup>, Japan<sup>6</sup>. Many technology reviews have been recently released<sup>7</sup> describing multiple technology tracks with respective opportunities and challenges.

The above efforts show the field of quantum mechanics to be in a stage of increasing innovation with the possibility of commercial impact.

In addition, have been recently reported<sup>8</sup> several startups globally in quantum innovation and commercialization, in different areas of applications. A few of them are from Scandinavia, where one is a notable Swedish company<sup>9</sup>. Further are recently reported increased global deal flows of private capital to the area<sup>10</sup>.

This early but clear evidence of plural technological opportunity and challenge, when combined with demonstrated commercial success stories<sup>11</sup>, signals that broadened commercialization could be expected in the coming decades, where early innovative commercialization has already started.

## 2.2 Themes for the call

In this call, the notion of quantum technology solutions is intended to be interpreted as “technologies for the dynamic control and manipulation of superposition and entanglement of quantum mechanical states, applied in solutions to meet customer demand”.

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<sup>1</sup> [Home | Chalmers](#)

<sup>2</sup> [The quantum age: technological opportunities \(publishing.service.gov.uk\)](#)

<sup>3</sup> [October 2020 - National Quantum Initiative](#)

<sup>4</sup> [Chinese team makes new breakthrough in quantum computing technology - CGTN](#)

<sup>5</sup> [Launching of the European Quantum Industry Consortium \(qt.eu\)](#)

<sup>6</sup> [Japan lines up Toshiba and NEC for quantum research group - Nikkei Asia](#)

<sup>7</sup> [Quantum Computing in the NISQ era and beyond – Quantum \(quantum-journal.org\); Materials challenges and opportunities for quantum computing hardware | Science \(sciencemag.org\);](#)

[Progress in quantum-dot single photon sources for quantum information technologies: A broad spectrum overview: Applied Physics Reviews: Vol 7, No 2 \(scitation.org\);](#)

[Quantum Computing: Progress and Prospects | The National Academies Press \(nap.edu\);](#)

[Single-electron operations in a foundry-fabricated array of quantum dots | Nature Communications;](#)

[A Molecular Approach to Quantum Sensing | ACS Central Science;](#)

[Superconducting quantum computing: a review | SpringerLink](#)

<sup>8</sup> [TQD \(thequantumdaily.com\)](#)

<sup>9</sup> [lownoisefactory.com :: HOME](#)

<sup>10</sup> [What Is Quantum Computing? \(cbinsights.com\)](#)

<sup>11</sup> [D-Wave Systems \(dwavesys.com\)](#)

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Vinnova expects to finance a project mix of different types of technologies and applications.

Vinnova has a task of promoting sustainable growth by improving the conditions for innovation. Improved conditions for innovation strengthen the capacity to achieve the SDGs in the 2030 Agenda. Through our efforts, we contribute to the global commitment to achieving the goals<sup>12</sup>.

Gender equality is a prerequisite for sustainable growth and can be found in the 2030 Agenda, as a specific goal, also as a perspective that will permeate the work on all other goals. The call therefore intends to contribute to an equal social development linked to two main perspectives.

One aspect that Vinnova follows up and assesses is whether both women and men take an equal share of the grant, participate in and have influence over the project<sup>13</sup>.

Another important aspect is to analyze and consider whether there are gender and/or gender aspects that are relevant in the problem area and useful of the solution. This question is mandatory to answer for all applicants and can be found under the heading "Project tasks" / "Projektuppgifter". Sex and/or gender dimensions will be evaluated according to the feasibility criterion, see section 7.1.

### **3 Who is the call addressed to?**

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<sup>12</sup> Read more about our work to contribute to the goals of Agenda 2030: [Agenda 2030 - the global sustainability goals as a driving force for innovation | Vinnova](#)

<sup>13</sup> Read more about what our work for equal innovation means for those who apply for grants from us: [Equal funding of innovations | Vinnova](#)

The project coordinator should be a Swedish small or medium-sized enterprise, [User guide to the SME Definition \(vinnova.se\)](https://www.vinnova.se).

The coordinator and eventual other project parties can be financed by Vinnova. In this call only legal entities can be financed, who are a Swedish organization or a foreign organization with a branch or establishment in Sweden. Other foreign entities can participate but are not financed by Vinnova.

## 4 What are we funding?

### 4.1 Activities for which funding can be sought

Vinnova finances costs that are eligible within project activities that lead toward expected project outcomes such as:

- Minimum viable commercialization-ready solutions
- Tests and validation of customer values
- Tests and validation of business models
- Tests and verification of product and/or services concepts
- Preparation and validation of scaled financing from e.g. validated private investors and commercial partners, also EU calls.

You can apply for the following activities:

- Tests
- Industrial research
- Experimental technical development work
- Experimental business development
- Experimental investigations with potential future customers and partners.

### 4.2 Basis for support and eligible costs

Project financing takes place through funding. Funding for organizations that conduct financial activities covered by rules on state support<sup>14</sup>. The rules govern, among other things, the types of costs and the proportion of them that may be covered by funding.

Grants will be awarded under Sections 7 and 9 of the Ordinance (2015:208) on State aid for research and development and innovation, i.e. as aid to start-ups

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<sup>14</sup> Read more on government support on our web page: [State aid to companies | Vinnova | Vinnova https://www.vinnova.se/sok-finansiering/regler-for-finansiering/statligt-stod/](https://www.vinnova.se/sok-finansiering/regler-for-finansiering/statligt-stod/). Here you also find our general terms for grants: [Terms and conditions for Vinnova funding | Vinnova](#)

under Article 22 of Commission Regulation (EU) No 651/2014 (GBER) and as support for <sup>15</sup>research and development projects under Article 25 of GBER. The activities of the project referred to in Article 25 shall constitute industrial research or experimental development<sup>1617</sup>.

Grants may also be awarded under section 2 p. 2 of the Ordinance (2015:208) on state aid for research and development and innovation, i.e. as *de minimis* aid under Regulation (EU) No 1407/2013. <sup>18</sup>Before you can be granted *de minimis*, you must submit a *de minimis* certificate.<sup>19</sup>

Non-state aid may be granted to parties that do not conduct economic activities <sup>20</sup> in accordance with Ordinance (2009:1101) with instructions for the Swedish Agency for Innovation Systems.

Eligible costs are set out in our Guide to Eligible Costs:

<https://www.vinnova.se/sok-finansiering/regler-for-finansiering/allmanna-villkor/>.

## 5 How large is Vinnova's grant?

The budget amounts to max one million SEK per project over a period of eight months (end November 2022 – July 2023). Vinnova expects to allocate the funding over approximately five projects which are granted funding.

In this call the project can receive co-financing from Vinnova with a maximum of 75 percent of the costs eligible for funding.

The maximum level of support per project part is determined per beneficiary.

## 6 Prerequisites for us to assess an application

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

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<sup>15</sup> [EUR-Lex - 02014R0651-20210801 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/lexuri/cs/lrq/?uri=CELEX:32014R0651-20210801-EN-EUR-Lex)

<sup>16</sup> [Microsoft Word - guide eligible costs -January 1, 2019.docx update for 2020 200206 \(002\) \(vinnova.se\)](#)

<sup>17</sup> [tabell\\_stodnivaer\\_statligt\\_stod.pdf \(vinnova.se\)](#)

<sup>18</sup> [http://ec.europa.eu/competition/state\\_aid/legislation/de\\_minimis\\_regulation\\_sv.pdf](http://ec.europa.eu/competition/state_aid/legislation/de_minimis_regulation_sv.pdf)

<sup>19</sup> The certificate is available at: <https://www.vinnova.se/sok-finansiering/regler-for-finansiering/statligt-stod/>

<sup>20</sup> Read more at: <https://www.vinnova.se/sok-finansiering/regler-for-finansiering/statligt-stod/>

- The project coordinator for the application shall be the legal entity at whose establishment the applied project will be carried out
- All project partners shall be legal entities
- The application shall be designed in accordance with the guidelines described in Section 9

## 7 Assessment of applications received

### 7.1 What do we assess?

Financing decisions are made based on an overall assessment of potential, actors and feasibility based on the following criteria.

#### Potential

- *Thematic fit.* How well the innovation themes proposed by the applicant are in line with the orientations and objectives described in section 2
- *Innovation.* How the proposed project and quantum technology solution is innovative
- *Quantum superiority* How the proposed quantum technology solution is functionally superior to other solutions from a customer perspective
- *Paradigmatic shift* How the proposed project could impact a paradigmatic shift of quantum technology

#### Actors

- *Ability to deliver.* How the participants possess the documented and demonstrated competencies and skills regarding technology, solutions, entrepreneurship and application domain expertise and further the financial ability for respective project part to co-finance its respective costs
- *Project coordinator* How the proposed project's coordinator has a documented and demonstrated skills of project management of multidisciplinary skills (technology, entrepreneurship, market, business)
- *How well the team (key people) is composed:* Gender distribution, and distribution of power and influence between women and men. Any imbalance must be explained in a credible and proposal specific manner.

## Feasibility

- *Project plan with budget:* The credibility and expediency of the project plan and activities for the implementation of the project within the set time, within budget and with expected results. Project approach, control, organization and involvement of project partners and other relevant actors, including users. A project plan that shows the activities, commitment, participation and mutual communication of all parties.
- *Utilization of the project results:* A timed hypothesis for subsequent commercial utilization of the project results, i.e. a hypothesis about how and which actors should commercialize the project results to external customers or for internal implementation
- *Sex and/or gender dimensions:* Describe how sex and/or gender dimensions have been integrated into the project plan
- *Risk management:* Risk for the project = probability x consequence, for both project implementation and subsequent commercial utilization

## 7.2 How do we assess eligible applications?

Applications that fulfil all formal requirements are assessed by an assessment group consisting of technology and business experts. All assessors are appointed by Vinnova.

We recommend that the application is written in English since some assessors of applications are expected to be primarily English-speaking.

Based on an overall recommendation from the assessors, Vinnova then makes the formal decision on rejecting or granting funds and communicates this decision to all applicants. The assessment of applications is carried out in competition between applications received.

# 8 Decisions and conditions

## 8.1 About our decisions

How much each party to the project is granted is set out in the decision. Funding will be granted according to the basis for support as stated in section 4. The basis for the aid is set out in the decision and determines the eligible costs.

Vinnovas decision to grant or reject an application cannot be appealed.

## 8.2 Conditions for grants

For projects granted, our general conditions to funding apply<sup>21</sup>. The terms include rules on project agreements, conditions for paying out, follow-up, reporting and usefulness of project results. Eventual scientific publication shall be done with open access in accordance with the Vinnova instructions.

If you do not comply with our terms and conditions, you may be liable for repayment. This also applies if you have been granted a grant incorrectly or with too much money.

## 9 How to apply

To apply for a grant, fill out a web-based form on the Vinnova portal for applications, Intressentportalen, which can be accessed via [www.vinnova.se](http://www.vinnova.se). There you also upload the following attachments:<sup>22</sup>

### Mandatory attachments and corresponding Vinnova templates

You must upload attachments according to Vinnova designed templates.

Link to the call's website with reference to templates:

[Quantum Step-Up 2022 | Vinnova](#)

1. Project description, English (recommended since some assessors could be international)
2. CV, English (recommended since some assessors could be international)
3. Project description, Swedish (not recommended since assessors could be international)
4. CV, Swedish (not recommended since some assessors could be international)
5. "De Minimis" certificates signed from the respective project partners applying for de minimis support
6. Model declaration for SMEs if you apply for a grant under Art 22

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<sup>21</sup> Current terms and conditions can be found on our website, together with help to understand and meet the conditions: [Terms and conditions for Vinnova funding | Vinnova](#)

<sup>22</sup> Templates for the annexes can be found on our website: XXX

Only documents will be assessed which are attached based on these templates. The attachments should be uploaded in PDF format.

We recommend that you use the templates in English and that the application is written in English. This is because assessors could be mainly English-speaking. If you choose Swedish templates and the Swedish language, Vinnova may use machine translation to translate the Swedish text into English for assessment.

Keep in mind that it takes time to make an application. You can start filling in text, then saving and continuing at later date. When the application is complete, mark it as ready. You can, at any time, unlock the application and make changes, right up to the application deadline.

Finalize and submit the application well in advance of the closing time of the call.

When the call has closed and the application has been registered with Vinnova, a confirmation will be sent out to the e-mail addresses of the user account, the manager of the project and the signatory/head of department. It may take a few hours for applicants to receive this email.

Should you not have received a confirmation via e-mail within 24 hours after closure of the call we ask you to contact us.

Once the application period has expired, completion of the application can only be done on request from Vinnova.

## **10 Who can read the application?**

Applications submitted to us become public documents, but we do not disclose information about an individual's business or operating conditions, inventions and research results if it can be assumed that any individual suffers harm if the information is disclosed.