

# Quantum Kick-Start

A call within Vinnova's 'Future Areas'

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## Revisions

| Date | Change |
|------|--------|
|      |        |

## 1 Offer in brief

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.

An analysis from Vinnova shows that the time has come for government stimulus and the injection of innovation capital regarding quantum innovation for commercialization. That's why we're launching the initiative 'Quantum Kick-Start 2021'.

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 'Quantum Kick-Start', aims to finance projects with the following **project goals:**

- **Quantum technology for pioneering commercial innovation**
- **'Minimum viable solution'; validated customer values and business models, verified product and/or services concepts**
- **Attraction of scaled financing from e g validated private investors and commercial partners, also to apply to EU calls**
- **Application areas for quantum technology, examples could be though not exclusively; metrology, simulation, modelling, communication, computing and further also enabling technology solutions dedicated to quantum technology**

The total funding from Vinnova is estimated to amount to SEK seven million.

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

Please note that the dates are preliminary. For up-to-date information see [www.vinnova.se](http://www.vinnova.se).

|                               |                                     |
|-------------------------------|-------------------------------------|
| Opening date                  | June 8, 2021                        |
| Application deadline          | September 22, 2021, <b>at 14:00</b> |
| Last decision date            | November 3, 2021                    |
| Project start no earlier than | November 10, 2021                   |
| Project start no later than   | November 30, 2021                   |

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Up-to-date information about the call and link to the Vinnova portal for applications, the 'Intressentportal', which 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

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>78910111213</sup> describing multiple technology tracks with respective opportunities and challenges.

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

<sup>2</sup> [Quantum technologies - GOV.UK \(www.gov.uk\)](#)

<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 \(quantum-journal.org\)](#)

<sup>8</sup> [Superconducting quantum computing: a review | SpringerLink](#)

<sup>9</sup> [A Molecular Approach to Quantum Sensing | ACS Central Science](#)

<sup>10</sup> [Single-electron operations in a foundry-fabricated array of quantum dots | Nature Communications](#)

<sup>11</sup> [Quantum Computing: Progress and Prospects | The National Academies Press \(nap.edu\)](#)

<sup>12</sup> [Progress in quantum-dot single photon sources for quantum information technologies: A broad spectrum overview: Applied Physics Reviews: Vol 7, No 2 \(scitation.org\)](#)

<sup>13</sup> [Materials challenges and opportunities for quantum computing hardware | Science \(sciencemag.org\)](#)

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>14</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>15</sup>. Further are recently reported increased global deal flows of private capital to the area<sup>16</sup>.

This early but clear evidence of plural technological opportunity and challenge, when combined with demonstrated commercial success stories<sup>17</sup>, signals that broadened commercialization could be expected in the coming decades, where early innovative commercialization has already started.

An analysis performed by Vinnova support a conclusion that the time is ripe for pro-active governmental stimulation and injection of innovation capital, particularly into a commercialization phase of quantum innovation.

## 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’**.

This call aims to finance projects with the following project results:

- **Quantum technology solutions for pioneering commercial innovation**
- **‘Minimum viable solution’; validated customer values and business models, verified product and/or services concepts**
- **Attraction of scaled financing from e g validated private investors and commercial partners, also to apply to EU calls**
- **Application areas for quantum technology, examples could be though not exclusively; metrology, simulation, modelling, communication, computing and further also enabling technology solutions dedicated to quantum technology**

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<sup>14</sup> [TQD \(thequantumdaily.com\)](https://thequantumdaily.com)

<sup>15</sup> [lownoisefactory.com :: HOME](https://lownoisefactory.com)

<sup>16</sup> [What Is Quantum Computing? \(cbinsights.com\)](https://cbinsights.com)

<sup>17</sup> [D-Wave Systems \(dwavesys.com\)](https://dwavesys.com)

Vinnova expects within the call 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>18</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>19</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?**

In this call can be financed only legal entities, 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.

The coordinator and eventual other parties involved in the project can be financed by Vinnova.

Active involvement of participants shall be described both financially and with regards to competences.

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<sup>18</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>19</sup> Read more about what our work for equal innovation means for those who apply for grants from us: [Equal funding of innovations | Vinnova](#)

## 4 What are we funding?

### 4.1 Activities for which funding can be sought

Vinnova decides on the payment of grants to companies in accordance with the Government Regulation (2015:208) on State aid for research and development and innovation and Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market under Articles 107 and 108 of the Treaty (the so-called Block Exemption Regulation, English abbreviation GBER).

Decisions on grants under this call are intended to be made under Section 9 of the Regulation (2015:208) on State aid for research and development and innovation and Article 25 of the European Commission's Block Exemption Regulation and relate to industrial research and experimental development work including technical experimental studies with potential future customers and partners, as well as 'Försumbart Stöd'/'De Minimis', which in this call relates also to costs of non-technical experimental business development.

This to lead toward expected project outcomes such as:

- Minimum viable commercialization-ready solutions
- Tests and validation of customer values
- Tests and validation 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

### 4.2 Eligible costs

Project financing takes place through funding. Funding for organizations that conduct financial activities covered by rules on state support<sup>20</sup>. The rules govern, among other things, the types of costs and the proportion of them that may be covered by funding.

Costs are eligible according to GBER article 25, industrial research and experimental development<sup>21,22</sup>.

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<sup>20</sup> Read more on government support on our web page: [State aid to companies | Vinnova | Vinnova State aid to companies | Vinnova | Vinnova](#). Here you also find our general terms for grants: [Terms and conditions for Vinnova funding | Vinnova](#)

<sup>21</sup> [Microsoft Word - guide stödberättigande kostnader -1 januari 2019.docx uppdatering inför 2020 200206 \(002\) \(vinnova.se\)](#)

<sup>22</sup> [tabell\\_stodnivaer\\_statligt\\_stod.pdf \(vinnova.se\)](#)

Project financing with ‘Försumbart Stöd’/’De Minimis’ covers all types of listed activities, thus includes also experimental business development. ‘Försumbart Stöd’/’De Minimis’ requires that signed forms of ‘Försumbart Stöd’ /’De Minimis’<sup>23</sup> be attached from the respective project partners seeking ‘Försumbart Stöd’/’De Minimis’.

A project can apply for a mix of activities, where different project partners apply for grants for respectively different parts, e g respectively technology and business development.

Non-economic organizations may also benefit from non-State aid if all the conditions for the payment of such aid are met and at Vinnovas request can be certified by the beneficiary at project start report for granted projects.

Only eligible costs within a project granted in this call can be financed by Vinnova.

## **5 How large is Vinnova’s grant?**

The total budget is estimated to amount to a total of SEK seven million over a period of eight months (2021 – 2022). Vinnova expects to allocate the funding over approximately four to eight projects which are granted funding. Vinnova can finance a maximum of SEK two million per project.

The conditions of the call regulate the support level of the total project; how large a part of project total eligible costs that Vinnova can grant. 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>23</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](#)

- 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 external 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 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>24</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, the 'Intressentportal', which can be accessed via [www.vinnova.se](http://www.vinnova.se). There you also upload the following attachments:<sup>25</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 Kick-Start 2021 | Vinnova](#)

1. Project description, English (recommended since 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 assessors could be international)
5. 'Försumbart Stöd'/'De Minimis' certification form, signed from respective project partner who apply for 'Försumbart Stöd'/'De Minimis'

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

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<sup>24</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>25</sup> Templates for the annexes can be found on our website: [Quantum Kick-Start 2021 | Vinnova](#)

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 will 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 Vinnova become public documents. Vinnova always conducts a confidentiality review when requesting disclosure of a public document. The Authority does not disclose information on the business or operating conditions, inventions and research results of individuals if it could be assumed that any individual is harmed if the data are disclosed.