

CALL FOR PROJECTS

Call for innovative quantum technology projects: Industrial research partnerships and support for entrepreneurship

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INTRODUCTION

Background

The quantum technology sector is booming across the globe. Recent advances in our understanding of quantum phenomena and how to manipulate and control quantum states have opened the door to new applications based on quantum superposition and entanglement. Basic quantum research and the first quantum technology revolution—which included the development of lasers to investigate the quantum properties of matter—are giving way to a new era. The second quantum revolution is already having constructive, real-world impacts on our daily lives, including quantum metrology and quantum sensors. Future advances in areas such as quantum computing and cryptography promise to be even more disruptive.

Interest in disruptive quantum phenomena has been growing for some time, attracting investment that has spawned a rich research ecosystem within Quebec in cryptography, high-performance computing, nanomaterials, and quantum photonics.

A number of innovation centres in Québec are collaborating with industry, research institutes, universities, and startups to mobilize expertise and grow the sector. The centres are hubs for expertise, know-how, and cutting-edge manufacturing infrastructure and act as vectors for quantum technology development.

Entrepreneurship is key to building an industry around digital and quantum technology. Small and medium-sized enterprises (SMEs) are the backbone of Québec's prosperity, especially when it comes to employment and economic contributions. Startups have high growth potential and a unique corporate culture based on flexibility, creativity, the development of disruptive technology, dynamic business models, and a global outlook, among other things.

Quantum technologies have the potential to produce far-reaching benefits and are often a source of innovations that help address global challenges and change our way of life. Developing these technologies means strengthening Québec's economy and making it more competitive.

Objectives

The objectives of the call for projects are to:

- Foster and consolidate innovation in the field of quantum technology
- Strengthen companies' capacity for technological innovation and create economic benefits by exploiting and transferring technology
- Help position Québec as a leader in quantum technology development

GENERAL INFORMATION

About the Ministry

The Ministère de l'Économie et de l'Innovation's mission is to support business growth, entrepreneurship, science, innovation, export, and investment. It also advises the government on economic development across Québec, in the spirit of:

- Job creation
- Economic prosperity
- Sustainable development

The Ministry aims to support research and innovation players in becoming more competitive in establishing, building upon, and transferring their expertise into the economic sector, especially in priority disciplines that are strategic for Québec's future.

ELIGIBILITY

Eligible organizations

This call for projects is open to all Québec SMEs seeking to undertake innovative projects that develop and commercialize quantum technology. With its four support streams it aims to advance:

- Innovative projects in the startup phase (under three years old), that have support from an incubator or accelerator (Stream 1)
- Innovative projects, from SMEs over three years old (Stream 2)
- Innovative projects from SMEs partnering either with (i), public research centres that are members of QuébecInno or (ii), partnering with a public research centre and another Canadian or international SME abroad. For non-Québec partnerships, only the Québec portion of the financial plan must comply with the funding terms and conditions for this call for projects (Stream 3)
- Innovative projects from SMEs that collaborate with either one or more partner SMEs (or startups) or a partner SME (or startup) in the rest of Canada or abroad. For non-Québec partnerships, only the Québec portion of the financial plan must comply with the funding terms and conditions for this call for projects (Stream 4)

Ineligible organizations

The following organizations are ineligible (both individually and as part of partnerships):

- Companies that are directly or indirectly controlled by provincial or federal governments, municipal entities, or companies that are majority-owned by crown corporations.
- Companies under the protection of the *Companies' Creditors Arrangement Act* or the *Bankruptcy and Insolvency Act*.
- Companies listed on the *Registre des entreprises non admissibles aux contrats publics*
- Any company that failed to meet its obligations after being served formal notice regarding previous funding from Ministère de l'Économie et de l'Innovation in the two years preceding the funding application.

The call for projects seeks to foster innovation in quantum technology derived from R&D in the following areas:

- **Quantum computing**, including, but not limited to, the development of quantum computers, quantum software, quantum computer programming languages, quantum algorithms, quantum simulations, and key supporting technologies for quantum computer development (e.g., microfabrication, refrigeration, and photon manipulation)
- **Quantum communications**, including quantum cryptography, quantum internet, and quantum networks, that use the principles of quantum photonics and have multiple applications, such as security, defense, and information storage and processing
- **Quantum materials**, including the development or simulation of new materials with innovative quantum properties
- **Quantum metrology and quantum detection**, including the development of innovative devices based on quantum principles (especially quantum photonics) and applications for accurately probing, measuring, and manipulating quantum properties of matter or photons

Projects must contribute to the development and commercialization of:

- Components for **quantum computers** and **quantum communications**
- Quantum technologies that fall within the following areas of application (non-exclusive):
 - **Life sciences**, including quantum simulation tools for designing new drugs (in service of or collaboration with artificial intelligence), and the development of innovative materials for medical applications
 - **Sustainable development**, including the development and use of devices such as quantum sensors to detect mineral deposits
 - **Transportation and logistics**, including the design of new innovative materials for vehicles or aeronautics and quantum simulation tools for optimizing logistics and supply chains in service of or collaboration with artificial intelligence

Note: Companies that have received funding under Ministère de l'Économie et de l'Innovation's Innovation Program must contact quantique@economie.gouv.qc.ca to confirm their projects are eligible.

Quantum technology startups must meet the following criteria:

- They must be legally incorporated according to Canadian or Québec law and registered with the *Registraire des entreprises du Québec*.
- They must be headquartered in Québec and their employees and subcontractors must be mainly based in Québec.
- 50% or more of the company cannot be owned by existing companies or organizations.
- They must have been incorporated for less than three years.
- They must own the rights to use the intellectual property in their product, process, or service.
- They must currently receive support from a business incubator or accelerator.
- They must allocate (or plan to allocate) a significant portion of their resources (50% or more) to business development, which extends from the design and development of the product, process, or service to the marketing stage.

Quantum technology SMEs must meet the following criteria:

- They must be legally incorporated according to federal or Québec law and registered with the *Registraire des entreprises du Québec*.
- They must be headquartered in Québec and their employees and subcontractors must be mainly based in Québec.
- 50% or more of the company cannot be owned by existing companies or organizations.
- They must have been incorporated for over three years.

SUMMARY OF THE FOUR STREAMS

| Stream | Apply to | Maximum duration | Maximum funding rate | Maximum total government funding rate | Maximum funding amount |
|--|-----------------|------------------|--------------------------|---------------------------------------|------------------------|
| Stream 1 – Innovative projects from startups | MEI | 1 year | 50% of eligible expenses | 75% of total project expenses | \$75,000 per project |
| Stream 2 – Innovative projects from SMEs | MEI | 1 year | 30% of eligible expenses | 50% of total project expenses | \$75,000 per project |
| Stream 3 – Innovative projects from SMEs in partnership with public research centres | PRIMA or Prompt | 3 years | 40% of eligible expenses | 60% of total project expenses | \$750,000 per project |
| Stream 4 – Innovation projects from SMEs in collaboration with one or more partner SMEs (or startups) | PRIMA or Prompt | 3 years | 50% of eligible expenses | 50% of total project expenses | \$750,000 per project |

STREAM 1 – INNOVATIVE PROJECTS FROM STARTUPS

Stream 1 is open to quantum technology startups that currently receive (or plan to receive) support from any of the following organizations:

- Centech (Centre de l'entrepreneurship technologique de l'ÉTS)
- ACET (Accélérateur de création d'entreprises technologiques)
- Entrepreneuriat Laval
- Quantino

Startups must provide proof of support (official letter signed by the incubator or accelerator) or show they have started the process of seeking support at the time of application.

Eligibility

Eligible projects must require research and innovation and address an issue related to the startup's development and growth. Projects may be technological (i.e., relating to the startup's main product or service) or organizational (i.e., relating to a growth issue for the company itself, such as staff or organizational structure).

FUNDING TERMS AND CONDITIONS

Funding

The Government of Québec's contribution under Stream 1 may not exceed **\$75,000** per project, for a maximum duration of **twelve months (one year)**. The funding rate may not exceed 50% of the total eligible expenses for the project.

The combined funding from various levels of government (municipal, provincial, and federal) may not exceed 75% of the total eligible project expenses.

Private contributions must cover at least 25% of eligible expenses.

Disbursement of funding is conditional on funding provided by the other partners involved, and successful completion of the project in accordance with the funding agreement and the annual budget.

STREAM 2 – INNOVATIVE PROJECTS FROM SMES

Stream 2 is open to quantum technology SMEs for the production of goods and services, or internal R&D.

Eligibility

Eligible projects must involve product or process innovation and can occur anywhere from the planning stage to pre-commercialization (technology showcase). The product or process may be intended for sale, or to be developed for the company's own purposes. Projects must:

- Involve the development of a new product or process, or provide significant improvement to an existing product or process
- Require sufficient innovation (i.e., the product or process must have a decisive advantage over existing solutions on the national or international market or sector)
- Involve technological or business risk or uncertainty for the company
- Require R&D activities to have either taken place, or require R&D is ongoing
- Have commercial potential (if the product or process is intended for sale)

FUNDING TERMS AND CONDITIONS

Funding

The Government of Québec's contribution under Stream 2 may not exceed **\$75,000** per project, for a maximum duration of **twelve months (one year)**. The funding rate may not exceed 30% of the project's total eligible expenses.

Combined funding from various levels of government (municipal, provincial, and federal) may not exceed 50% of the total eligible project expenses.

Private contributions must cover at least 50% of the eligible expenses.

Disbursement of funding is conditional on funding provided by the other partners, and successful completion of the project in accordance with the funding agreement and the annual budget.

STREAM 3 – INNOVATIVE PROJECTS FROM SMEs IN PARTNERSHIP WITH PUBLIC RESEARCH CENTRES

Eligibility

Eligible projects must involve collaborative research in quantum technology in partnership with a public research centre that is a member of QuébecInnove.

Projects must be submitted to PRIMA (Pôle de recherche et d'innovation en matériaux avancés au Québec) or Prompt.

FUNDING TERMS AND CONDITIONS

Funding

Funding is granted through PRIMA or Prompt and is non-repayable and non-recurring. The maximum funding per project from the Ministry is \$500,000 per year, up to a total of \$750,000 per project over three years. The funding terms and conditions are based on the project's technology readiness level (TRL).

Disbursement of funding is conditional on funding provided by other partners and successful completion of the project in accordance with the funding agreement and the annual budget.

STREAM 4 – INNOVATIVE PROJECTS FROM SMEs IN COLLABORATION WITH ONE OR MORE PARTNER SMEs

Eligibility

Eligible projects must involve collaborative quantum technology research with one or more partner SMEs. Partner companies must share the project costs, benefits, and intellectual property.

Projects must be submitted to PRIMA or Prompt.

FUNDING TERMS AND CONDITIONS

Funding

Funding is granted through PRIMA or Prompt and is non-repayable and non-recurring. The maximum funding per project from the Ministry is \$750,000 per project over three years. The funding terms and conditions are based on the project's technology readiness level.

Disbursement of funding is conditional on funding provided by other partners and successful completion of the project in accordance with the funding agreement and the annual budget.

ALL STREAMS

Financial plan

The financial plan must include all financing required to carry out the project (revenue and expenses).

ELIGIBLE EXPENSES

To be eligible, expenses must be necessary, reasonable, and directly related to the project. Expense eligibility is determined by the Ministry when allocating the grant.

Eligible project expenses for this call for projects include:

- Salaries, wages, and employee benefits related to the project¹
- Travel and accommodation expenses, as set out by the Ministry
- Required equipment and supplies
- Equipment purchase or lease (maximum 25% of total eligible expenses)²
- Intellectual property costs (legal support)
- Honoraria (including for researchers)
- Communications costs
- Subcontracting costs

¹ The cost of releasing faculty members to carry out project activities cannot be included in this expense item.

² For purchases, the equipment must cost no more than \$15,000 CAN before taxes.

Expenses incurred prior to the submission date are ineligible. The following expenses are also **ineligible**:

- Expenses related to the rental of office space or labs to expand the business (e.g., subsidiary or additional office)
- Debt servicing, repayment of future loans, capital losses or capital replacement, and capital outlay
- Capital expenditures and amortization expenses
- Sales taxes
- Expenses not included in the financial plan as shown in the application
- Expenses that have already been funded by the Ministry
- Purchase costs for core equipment (e.g., a machine that costs 60% of the provided funding)

APPLICATION PROCEDURE

Deadline

All electronic applications must be received by **May 30, 2021, at 4:00 p.m EST.**

Streams 1 and 2:

Required documents

Guidelines:

1. Applications must be written in French and include:
 - An application letter signed by the person authorized to sign the funding agreement
 - A completed and signed copy of the *funding application* for the corresponding stream
 - A description of the project (structure, financial plan, partners, objectives, actions, deliverables, and expected benefits)
 - A letter of support from the startup's incubator or accelerator (Stream 1)
2. The project description must be clear and concise and **must not exceed five pages**. It must be submitted in PDF or Word format, Arial font type, size 11. If appendices are necessary, their total must not exceed three pages. Applicants must respect the page limits for their applications to be considered.

Applicants must email a **signed electronic copy of the application** in PDF or Word format to quantique@economie.gouv.qc.ca by 4:00 p.m. EST on May 30th, 2021.

Streams 3 and 4:

Projects must be submitted to PRIMA or Prompt.

PRIMA

Michel Lefevre

Phone: 514-284-0211, ext. 227

Email: michel.lefevre@prima.ca

Prompt

Jinny Plourde

Phone: 514-875-0032, ext. 14

Email: jplourde@promptinnov.com

ASSESSMENT

Assessment criteria

Projects will be assessed according to the following criteria:

- Project objectives, quality, and relevance
- Degree of innovation
- Commercialization potential
- The team and organization's ability to complete the project
- Intellectual property protection strategy
- Benefits for Québec (economic and social, expertise building)

Streams 1 and 2

| OVERALL SCORE | |
|--|---------------------|
| A – Degree of innovation | Subtotal: / 20 |
| B – Project rating | Subtotal: / 40 |
| C – Partnerships and expertise | Subtotal: / 20 |
| D – Anticipated benefits | Subtotal: / 20 |
| | TOTAL: / 100 |
| * Projects are recommended for funding if each score (scientific and technological/economic assessment) is over 70%. | |

Streams 3 and 4

| OVERALL SCORE | |
|--|---------------------|
| A – Relevance and feasibility | |
| A1 – Relevance | / 15 |
| A2 – Expertise and partnerships | / 15 |
| A3 – Project execution | / 10 |
| A4 – Risk analysis | / 10 |
| | Subtotal : / 50 |
| B – Project benefits | |
| B1 – Intellectual property protection strategy | / 10 |
| B2 – Financial resources | / 10 |
| B3 – Benefits for the companies and the sector | / 15 |
| B4 – Benefits for Québec | / 15 |
| | Subtotal: / 50 |
| | TOTAL: / 100 |
| * Projects are recommended for funding if each score (scientific and technological/economic assessment) is over 70%. | |

ETHICS AND CONFIDENTIALITY

Personal and confidential information will be collected and used in accordance with the *Act respecting access to documents held by public bodies and the protection of personal information* (CQLR, c. A-2.1), hereinafter referred to as the “Access Act” and subject to any exceptions provided therein.

For the purposes of evaluating and verifying projects as part of this call for projects, personal and confidential information may be collected and used by those involved in the project assessment and selection process. Some personal or confidential information may be provided to the assessment committee for the purposes of processing applications, in accordance with the consent provided on the application form.

If personal and confidential information is collected, it will remain confidential after the project selection process is complete. It will be used by the Ministry and the assessment committee as part of the program or project monitoring and assessment.

Members of the assessment committee are required to sign a confidentiality agreement regarding use and confidentiality of personal information.

Disclosure of any personal or confidential information to any third-party organization will only be carried out with the organization’s explicit consent and in accordance with the Access Act.

In addition, Ministry staff must comply with the *Regulation respecting ethics and discipline in the public service* (CQLR, c. F-3.1.1., s. 3) to preserve and strengthen public confidence in the public service’s integrity and impartiality and provide high-quality services.

QUESTIONS

Please email any further questions to quantique@economie.gouv.qc.ca.

APPENDIX

Application package contents

Applications must include a project description (maximum five pages). The document should include the following:

- Project description (purpose, objectives, focus, actions and activities, planned areas of research and innovation, etc.)
- Budget with expenses and revenue, including detailed partner contributions
- Explanation of the added value of the funding requested from the Ministry
- Basic principles and regulations for intellectual property management
- Skills of project staff
- Existing or planned partnerships and division of roles and responsibilities
- Potential benefits for Québec (economic and social)

If appendices are necessary, their total must not exceed three pages.

Applications must be clear and concise. Applicants must respect the page limit for their applications to be considered.

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