FABrIC Program Guide

Propulsé par CMC Microsystèmes
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FABrIC

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FABrIC is a five-year, $223M project to secure Canada's future in semiconductors. FABrIC will lower barriers faced by Canadian companies to develop semiconductor manufacturing processes, to create semiconductor Internet-connected products and services (IoT), and to export into a global market.

FABrIC will build the national ecosystem and foster collaboration between industry, not-for-profits, academics, and government and leverage Canada's technological reputation, strengths, and existing assets.

Powered by CMC Microsystems

In its 40-year history, CMC Microsystems has been at the forefront of technological change, managing federal and provincial government investments to introduce advanced technology, to support research, and to impact Canada's industrial high-tech landscape.

Acknowledgements

FABrIC is an Innovation, Science and Economic Development Canada (ISED) Strategic Innovation Fund (SIF) investment.

Canada

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For inquiries about this publication: info@fabricinnovation.ca

To download a copy of this publication in French: fabricinnovation.ca/fr

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Program Guide

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1. Purpose

This document describes FABrIC services and benefits available in Canada. At a glance, these are:

- Challenge projects: non-repayable grants for up to fifty percent (50%) of eligible project expenses for Industry participants and up to 100% of eligible project expenses for academics
- Training, reskilling, upskilling courses
- Quantum algorithm development support
- Workshops and Webinars
- IP Registry, IP Repository
- Members Registry and Members Listing

Relevant documents:

FABrIC Program Guide	Describes how industry and academics in Canada can connect with FABrIC and access FABrIC services (membership, challenge project funding, support services, IP, training, etc.). Applicable to all users, industry and academics.
FABrIC Academic Subscription Guide	Describes how academics in post-secondary institutions in Canada can access FABrIC academic services (CAD tools, chip fabrication, training, etc.)
FABrIC Intellectual Property Strategy	Describes expectations and requirements on IP used or created in FABrIC-supported projects. Applicable to all users, industry and academics.
FABrIC Challenge Projects Guide	Contains detailed instructions for applying to FABrIC Challenges and managing FABrIC-supported projects e.g., tracking expenditures, submitting claims, reporting KPIs.
FABrIC Challenge Call DATE/THEME fabricinnovation.ca/challenges	Describes the details of a specific FABrIC Challenge call for proposals, e.g., technology/application theme, funding available, submission deadlines, etc.

2. FABrIC Membership & Getting Help

FABrIC membership is structured with two membership types:

Ecosystem Membership

- ✔ No cost
- ✔ Open to organizations and individuals in Canada, including professionals, academics, government and industry experts with interest in the sector

Academic Subscribers*

- ✔ Paid subscriptions
- ✔ Open to academics, researchers and students located at Canadian post-secondary institutions
- ✔ Academic subscribers also hold an Ecosystem Membership

Options to connect with FABrIC:

FABrIC Website

fabricinnovation.ca

Access publicly available information on FABrIC Challenges, Innovation Platform, and Canadian semiconductor ecosystem events and developments.

Sign up for the FABrIC newsletter

fabricinnovation.ca

Receive updates on Challenge calls, events, and more.

Join as a FABrIC Member

fabricinnovation.ca/member

- FABrIC Challenge proposal applications for funding
- FABrIC Members IP Registry
- FABrIC Members IP Repository*
- FABrIC Members registry/listing
- Quantum compute infrastructure and technical support **
- Training courses**
- Events **
- Technical and fabrication support services for Challenges*
- And more…

For general enquiries please visit fabricinnovation.ca

or contact us at info@fabricinnovation.ca

* Certain products and/or services available are subject to third party or other usage terms and conditions and may require approval by such third party(ies).

** Some fees may apply

Become a Member

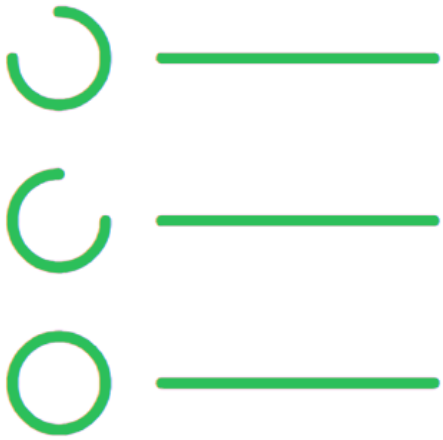
You can become a FABrIC member through the FABrIC website. Members must be associated with an organization or post-secondary institution in Canada. If your organization or institution has not yet been registered in FABrIC, you can continue to enter your information. A member of the registration team will reach out to your organization or institution to complete the registration. You will receive an email requesting verification of your email address.

Once the information has been validated, you will receive a second email asking you to create a password. At this point you'll be able to log into the member portal. Members are responsible for ensuring their information is complete and up to date and for safeguarding their username and password. Members must also comply with the Members terms of use.

Member Registry

FABrIC members have access to the Members registry. The registry includes information about the Member organizations and institutions including for example industry, size, areas of interest, services and products, contact information etc.

This registry is intended to promote awareness, networking, collaboration and partnering within the ecosystem. Information collected and shared is compliant with the FABrIC privacy policy.



3. What Is FABrIC?

FABrIC is a five-year, $220M project to help secure Canada's future in semiconductors. FABrIC will lower barriers faced by Canadian companies who develop semiconductor manufacturing processes, create semiconductor Internet-connected products and services (Internet of Things (IoT), and participate in the global semiconductor market. FABrIC will build a national ecosystem and foster collaboration between Industry, not-for profits (NFPs), academics, and government in the development of specialized Canadian semiconductor fabrication capabilities and the development and commercialization of new Canadian semiconductor-based products.

Vision: Canada is a recognized key player in the Global Semiconductor Supply Chain.

Mission: Build a vibrant and sustainable Canadian Semiconductor Ecosystem with world-class talent and global impact.

Strategic Objectives

ECOSYSTEM AND COLLABORATION

Create a vibrant and sustainable ecosystem that provides networking, training, and collaboration opportunities which enable Canadian industry, NFP's, academics and researchers to work together to advance and accelerate semiconductor product commercialization and the development of semiconductor technology and related intellectual property (IP) for the benefit of Canada.

NEW ADVANCED SENSOR AND SEMICONDUCTOR PRODUCTS

Foster the growth and expansion of companies developing and commercializing advanced sensors and other semiconductor products and services in Canada targeted at the rapidly growing and strategically important IoT market with direct applications in clean tech, electrified vehicles, 5/6G data communications, healthcare, agriculture, biotech, mining and other strategically important sectors in Canada.

ACCELERATE QUANTUM APPLICATIONS

Accelerate the development of quantum-ready companies and quantum computing applications in Canada by providing access and technical assistance to small/medium sized enterprises (SMEs) and academics for quantum-based hardware and software development and prototyping.

FABRICATION SUPPLY CHAIN CAPACITY AND CAPABILITY

Develop widely accessible semiconductor fabrication capacity and capability in Canada to strengthen and deepen Canada's supply chain for the design, prototyping, fabrication, assembly, and test of new advanced sensors and other made-in-Canada semiconductor products addressing the Internet of Things (IoT) market. Key areas of focus are photonics, microelectromechanical systems (MEMS), compound semiconductors, quantum/ superconducting devices and related advanced packaging and test technologies.

SECURE PIPELINE OF HQP

Create and train a sustainable pipeline of highly qualified personnel (HQP) with critical skills required for product development and manufacturing roles in Canadian semiconductor companies.

CANADIAN INTELLECTUAL PROPERTY

Create Canadian intellectual property (IP) and commercialize this IP for the benefit of Canada.

SUSTAINABLE INNOVATION PLATFORM

Provide a sustainable FABrIC Innovation Platform for Canadian academics, researchers, and SMEs which provides them affordable, timely access to state-of-the-art semiconductor design tools (CAD), fabrication and assembly technologies (including access to global supply chains), test and characterization tools, and technical expertise in product development and manufacturing needed to train HQP and to advance novel product and device development projects.

RESILIENT SUPPLY CHAIN

Enhance national security and resiliency in the supply of critical semiconductor products and technologies by creating an enhanced supply chain with trusted Canadian partners and a larger pool of highly trained specialists in semiconductor product design and fabrication technologies.

INTERNATIONAL COLLABORATION

Promote international collaboration and partnerships to attract international investment and HQP to Canada and to exchange knowledge and best practices related to semiconductor fabrication, product development, and supply chain.

FABrIC has been structured with four main activities aligned to achieving the strategic objectives;

1) Development of the ecosystem;
2) Semiconductor Fabrication Challenge Projects;
3) IoT Product Development Challenge Projects;
4) Innovation Platform Delivery.

4. Ecosystem Development

FABrIC will grow the semiconductor ecosystem in Canada and leverage the skills and resources of the entire value chain by:

- ✔ **PROVIDING** ecosystem and partnering infrastructure including the FABrIC website, member portal, secure access to IP, resources and more
- ✔ **HOSTING** the annual 'Canadian Semiconductor Symposium', workshops, webinars, matchmaking and pitch events, other related events across Canada
- ✔ **FOSTERING** collaborations between industry, academics, industry associations and Canadian global innovation clusters
- ✔ **PUBLISHING** monthly newsletters and other related communications to keep you informed
- ✔ **ORGANIZING** multi-sectoral outreach activities to align FABrIC activities with the needs of sectors of national economic strategic priority
- ✔ **POSTING** calls for Challenge projects to stimulate the development and growth of industry and academics in the Canadian
- ✔ **PARTICIPATING** in and hosting international missions to highlight Canadian semiconductor capability and attract international investment and HQP
- ✔ To keep up to date on events, please sign-up for the FABrIC newsletter and check the website www.fabricinnovation.ca

5. FABrIC Challenge Projects

Challenge Projects

FABrIC Challenge Projects are calls to Canadian industry and academics to innovate. FABrIC will run two types of Challenges.

In **Semiconductor Fabrication Process Development** challenges – we'll be looking for novel ways to build the chips that power the products. These are calls for manufacturers in Canada to run projects to enhance or develop new processes in the four core technology areas. At least one challenge call will be issued annually in each of the four core technology areas, with total target funding of $32M.

Product Development Challenges for made-in-Canada IoT Devices. These projects will focus on the development and commercialization of new advanced sensors and other semiconductor products targeting strategic end-use sectors. Multiple challenge calls will be issued annually with a total target funding of $34M.

Together these Challenge projects will help to build an accessible made-in-Canada supply chain for new semiconductor product development.

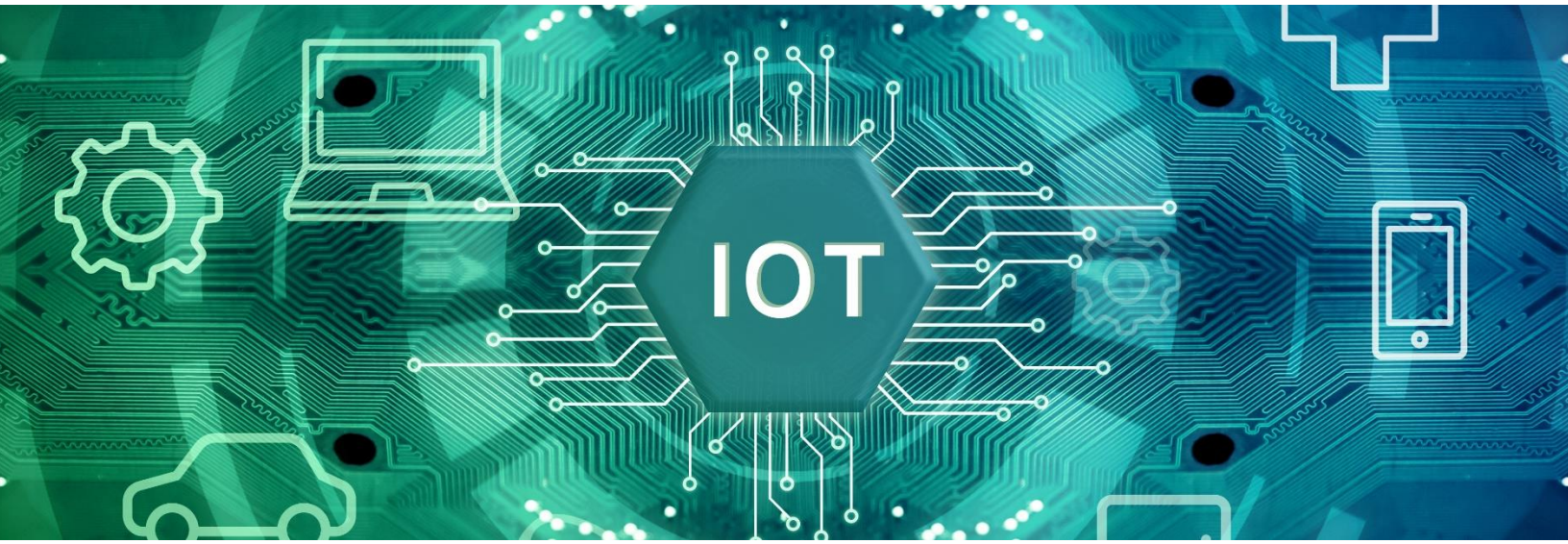
FABrIC will provide up to 50% of R&D costs for projects led by SMEs in Canada and up to 100% of the costs incurred by academics and researchers. Note that MNEs may also qualify for funding in some fabrication challenge calls.

Semiconductor Fabrication Process Challenges

FABrIC will issue calls for Semiconductor Fabrication Process Challenge Projects which will support organizations to develop and install new specialized processes for rapid prototyping and low to medium volume semiconductor manufacturing in Canada. Key areas of focus include photonics, microelectromechanical systems (MEMS), compound semiconductors, and quantum/superconducting technologies, including related test and advanced packaging technology. These challenges are expected to leverage and expand existing Canadian fabrication capabilities and infrastructure in industry (SMEs, MNEs and NFPs) as well as in academia (university labs etc.). This creates and grows critical supply chains for the development and manufacturing of new and innovative products in Canada. Support services to develop design tools and methods, etc. to enable the rapid adoption of these technologies by the ecosystem will also be provided. Challenge recipients will be required to provide broad and favourable access to these fabrication processes to the Canadian ecosystem. Challenges and ecosystem activities will also foster collaboration between fabrication partners to create a more coherent and aligned supply chain to support and accelerate product development in Canada.

IoT Product Development Challenges

FABrIC will issue calls for IoT Product Development Challenge projects which will provide funding and fabrication access support to Canadian companies and academics for the design, development and commercialization of novel advanced sensors and other semiconductor products in Canada targeted at the rapidly growing and strategically important internet of things (IoT) market. These challenges will stimulate and accelerate product development activities in Canada and will increase Canadian semiconductor content in applications in clean tech, electrified vehicles, 5/6G datacom, healthcare, agriculture/agri-food, advanced manufacturing, mining, and other strategically important sectors in Canada. The Challenge calls will also foster the use of Canadian fabrication supply chain partners and new fabrication capabilities developed with FABrIC support where possible.



6. What is the FABrIC Innovation Platform?

The Innovation Platform provides a sustainable pipeline of highly qualified personnel (HQP) for the sector in Canada, supports the development of internationally competitive research in semiconductor technologies and devices, accelerates Canada's readiness for the adoption of quantum computing applications and supports the development and sharing of resources and IP within the ecosystem to accelerate new product development and technology adoption.

The Innovation Platform has four core activities:

1) HQP Development:
One of FABrIC's objectives is to create a sustainable pipeline of Highly Qualified Personnel (HQP) equipped with critical skills for product development and manufacturing roles in Canadian semiconductor companies through the following initiatives:

I. CAD*
Providing training on and affordable access to state-of-the-art semiconductor design tools and methods to academics and students in post-secondary institutions in Canada. This gives academics and students hands-on experience in designing novel semiconductor devices and products to support their research and skills development.

II. Fabrication*
Providing training on and affordable access to advanced semiconductor fabrication services (both Canadian and international) for prototyping devices for academics and students in post-secondary in Canada. This gives academics and students the opportunity to fabricate and test their novel devices and products to further support their research and skills development.

III. Basecamp training*
Running intensive courses in core technologies including full cycle product development; design/prototype fabrication/test for academics and students in Canada. Basecamps are also open to Members from industry.

IV. Workshops
Developing and delivering technical workshops and webinars for all members, related to semiconductor technologies, product, and process development methods.

* Academic Subscriptions required

2) Upskilling and re-skilling HQP:
FABrIC is dedicated to upskilling and reskilling HQP across both STEM and non-STEM disciplines. Our program develops and delivers a range of technical training courses for members, from introductory to advanced levels, aimed at reskilling professionals such as computer scientists, chemists, biologists, and others. These courses enable participants to leverage advanced semiconductor technologies and services within their respective fields.

3) Accelerate the development of quantum-ready companies and quantum computing applications in Canada:
FABrIC provides access to Canadian quantum computing infrastructure and technical assistance to small/medium sized enterprises and academics* for quantum-based algorithm development and prototyping. This includes access to design environments, computing platforms and coding support. FABrIC technical support includes quantum coders who can help develop, prepare, and execute code on available quantum machines. FABrIC's quantum team also collaborates with researchers to make quantum computing research more accessible, and hosts quantum coding training events and workshops.

4) Accelerate new semiconductor product research, development, and commercialization:
FABrIC members have access to the FABrIC IP repository**. The repository contains 'leave-behind resources' created by the FABrIC technical team such as technical reference designs, design tools and methods and other resources (including the creation of related IP) for use by the ecosystem. FABrIC members are also encouraged to share resources and to contribute to the IP repository.

** See section 7

* Academic subscriptions required

7. IP Registry, IP Repository

Through Challenge Projects and the Innovation Platform, FABrIC members will develop Canadian intellectual property elements. Intellectual property ("IP") refers to intangible intellectual assets contributed to ("Background IP") and arising from ("Foreground IP") projects in which FABrIC invests. IP includes, but is not limited to, patents, trademarks, copyrights, industrial designs, software, algorithms, data, machine learning models, trade secrets, confidential information, and know-how.

The goal of FABrIC investment is not just the creation of IP, but wherever possible, to enable the commercialization of that IP to create value for Canadian businesses and for Canadians.

"Leave-behind-IP" is defined as ecosystem developments created for or by CMC in support of the innovation platform and challenge projects (i.e., PDKs, reference designs, support material, etc.), or IP made available by an ecosystem participant for reuse by the members. This IP must not be encumbered for use by the ecosystem. Leave-behind-IP will be preferentially available to the Canadian ecosystem.

Ownership of any foreground IP arising from funded FABrIC projects will vest with the Participants' organization(s) who have conceived the IP. Participants must exclusively own and retain ownership of the resultant Foreground IP in Canada for a minimum of five (5) years after the end of their project agreement.

Academic Participants involved in Innovation Platform projects will be expected to work within the IP management framework of their respective Institutions. FABrIC will not impede Academic Participants using the services of the Innovation Platform from publishing research results.

For further details regarding the management of IP generated through FABrIC funding, please refer to the FABrIC IP Strategy fabricinnovation.ca/resources.

IP Registry

FABrIC's IP Registry contains descriptions of the IP generated through FABrIC-supported Challenge projects, as well as 'Leave-behind' IP. The Registry contains sufficient information to enable members to understand the commercial application of the IP and allows members to share and search for potential licensing, partnership and collaboration opportunities.

IP Repository

FABrIC's IP repository contains Leave-behind-IP and resources that are available for use by members, in downloadable format. These formats may include compressed files such as zip or tar, and code repositories such as git. Access to this IP may have separate terms of use. Members are encouraged to contribute to the IP repository.

Access to the IP Registry and Repository is open to FABrIC members. Through the IP Registry and Repository, FABrIC will create a competitive advantage for all members by providing a categorized selection of highly relevant IP that is available for licensing or is freely available and can be easily searched and identified by members.

fabricinnovation.ca/innovation

8. Equity, Diversity, and Inclusion (EDI)

The FABrIC project is powered by and managed by CMC. CMC is unwavering in its commitment to the principles of Equity, Diversity, and Inclusion (EDI). We believe that fostering an inclusive environment enhances innovation, creativity, and excellence. We recognize that a breadth of perspectives, skills, and experiences contribute to excellence in research and innovation. This culture is the responsibility of every participant in the ecosystem, including employees, funders, investors, sponsors, institutions, companies, researchers, advisors, administrators, and reviewers. As part of our dedication to EDI, CMC is also actively participating in the Government of Canada's 50-30 Challenge, which aims to accelerate gender parity and the inclusion of under-represented groups in leadership roles.

EDI is a cornerstone of our governance and operational practices. FABrIC Challenge, Innovation Platform and Ecosystem Development proposals that advance EDI principles are given additional assessment points, reflecting our commitment to creating a diverse and inclusive community. We recognize that embracing EDI is not just a goal, but a continuous journey. By embedding these values into our decision-making and resource allocation processes, we aim to ensure that our investments yield the maximum benefit for all members of our community.

9. Technology Readiness Levels (TRLs)

For the purposes of FABrIC Challenge projects, applications should **describe the TRL the research is currently working to achieve.**

Activities for proposed projects will generally fall under Technology Readiness Levels (TRLs) 3 to 7 but could cover the whole range of TRLs 1 to 9. Innovation, Science and Economic Development Canada (ISED) (Innovation Canada) describes stages of development, including a TRL assessment tool and checklist, online at https://ised-isde.canada.ca/site/innovation-canada/en/technology-readiness-levels.

Technology Development Stage	TRL	Definition	Description
Fundamental Research	1	Basic principles observed and reported	Scientific research begins to be translated into applied research and development (R&D). Activities might include paper studies of a technology's basic properties.
	2	Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. Activities are limited to analytic studies.
Research and Development	3	Analytical and experimental critical function and/or proof of concept	Active research and development is initiated. This includes analytical studies and/or laboratory studies. Activities might include components that are not yet integrated or representative.
	4	Product and/or process validation in laboratory environment	Basic technological components are integrated to establish that they will work together. Activities include integration of "ad hoc" hardware in the laboratory.
	5	Component and/or validation in a simulated environment	The basic technological components are integrated for testing in a simulated environment. Activities include laboratory integration of components.
Pilot and Demonstration	6	System/subsystem model or prototype demonstration in a simulated environment	A model or prototype that represents a near desired configuration. Activities include testing in a simulated operational environment or laboratory.
	7	Prototype ready for demonstration in an appropriate operational environment	Prototype at planned operational level and is ready for demonstration in an operational environment. Activities include prototype field testing.
Levels 7 through 9 represent the pre-commercialization gap for innovations.	8	Actual technology completed and qualified through tests and demonstrations	Technology has been proven to work in its final form and under expected conditions. Activities include developmental testing and evaluation of whether it will meet operational requirements.
Early Adoption	9	Actual technology proven through successful deployment in an operational setting	Actual application of the technology in its final form and under real-life conditions, such as those encountered in operational tests and evaluations. Activities include using the innovation under operational conditions.

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