

A NATIONAL SEMICONDUCTOR STRATEGY FOR CANADA:

Policy Options and Recommendations

CANADA'S SEMICONDUCTOR COUNCIL
FABrIC
Powered by Propulsé par CMC
ICTC CTIC
ventureLAB™

EXECUTIVE SUMMARY

Semiconductors are the invisible infrastructure of modern life. These chips—embedded in everything from smartphones to satellites—power the technologies that drive Canada's economy, security, and society. In the age of artificial intelligence (AI), quantum computing, and digital transformation, semiconductors may no longer be considered a peripheral industry: they are the cornerstone of national competitiveness. For Canada, the semiconductor sector is both a strategic vulnerability and a once-in-a-generation opportunity for growth.

To this end, a consortium of semiconductor and technology industry associations—comprising Canada's Semiconductor Council, CMC Microsystems, the Information and Communications Technology Council, and VentureLAB—have prepared this policy briefing to inform policymakers and industry leaders of the opportunity at hand.

Given their integral role, **the Consortium calls on Canada to develop a National Semiconductor Industrial Strategy to protect its domestic industries, create thousands of high-paying skilled jobs, and attract the investment needed to supercharge our economy**.

THE BACKBONE OF THE AI ECONOMY

AI's rapid growth relies on access to high-performance, energy-efficient, and secure chips capable of training and deploying complex AI models. Every advancement in AI—from generative tools and autonomous systems to precision health, clean energy, and defence—depends on semiconductor innovation. These same chips also support essential aerospace and defence systems, including sensors, secure communications, and cyber-physical infrastructure.

Canada's strengths in semiconductor design, compound semiconductors, photonics, micro-electromechanical systems (MEMS) and advanced packaging give it a technological edge in producing specialized hardware for AI, telecommunications, and high-performance computing. With more than 250 firms active in research, design, and manufacturing—and strong clusters in Ottawa, Toronto-Waterloo, Montréal-Bromont, Edmonton, and Vancouver—Canada has built a globally connected, innovation-driven ecosystem focused on high-value segments of the global value chain.

CANADA'S STRATEGIC ADVANTAGE

Canada's competitive advantage lies in its specialization in high-value, lower-volume segments of the semiconductor supply chain—fields driven by innovation, reliability, and performance. Unlike jurisdictions focused on mass fabrication, Canada specializes in R&D, design, photonics, and advanced packaging—key enablers of AI, defence innovation, and advanced computing. Additionally, Canada is home to major semiconductor design centres for multinational enterprises with offshore, high-value fabrication facilities.

This specialization positions Canada as a trusted partner in the global chip ecosystem. Supported by world-class research institutions, a robust engineering talent pool, and integration across North American and European markets, Canada is well placed to lead next-generation semiconductor innovations that fuel both economic growth and technological leadership.

WHY CANADA NEEDS A SEMICONDUCTOR STRATEGY

Despite these advantages, **Canada remains the only G7 country without a national semiconductor strategy**—a gap that threatens our competitiveness, our capacity to scale innovation, and our ability to exercise technological sovereignty over our digital economy. Other jurisdictions have moved decisively: the United States has invested over US$50 billion (C$69.97 billion) through the CHIPS and Science Act, the European Union has launched the €43 billion (C$70.06 billion) EU Chips Act, and Asian economies such as Taiwan, South Korea, and Japan have deepened leadership through decades of coordinated industrial policy.

Without a strategic approach, Canada risks:

- Losing talent and expertise to ecosystems offering stronger incentives and infrastructure.
- Constrained innovation due to limited fabrication and prototyping capacity.
- Missed opportunities in AI, clean technology, and defence modernization.
- Reduced competitiveness in a world where industrial strategy drives technological success.

A CALL TO ACTION FOR A NATIONAL SEMICONDUCTOR STRATEGY FOR CANADA

A national semiconductor strategy would align investment, accelerate commercialization, strengthen supply chains, and ensure Canada's innovation ecosystem can compete globally. Policy measures needs to focus on:

1. Establishing a National Semiconductor Strategy Task Force.
2. Launching a Canadian Chips Initiative with targeted funding to build Canada's domestic semiconductor capacity in high-priority and strategic industries.
3. Cultivating Canada's semiconductor workforce through the creation of a Semiconductor Talent and Innovation Hub.
4. Developing a Semiconductor Supply Chain Resilience Framework to protect Canada's domestic semiconductor industry.

Semiconductors are the cornerstone of the AI age, and Canada is uniquely positioned to take the lead. Boasting exceptional talent, world-class university and research institutions, a vibrant culture of innovation, and strong technological foundations, Canada has the potential to shape the future of AI and semiconductor industries. However, this vision requires decisive action and clear leadership.

By implementing a comprehensive national semiconductor strategy, Canada can establish itself as a go-to global destination for cutting-edge semiconductor research and innovation and related software design. This would also signal Canada's commitment to the semiconductor sector on the global stage and fuel groundbreaking innovation, drive high-value economic growth, and secure a resilient and competitive digital future for generations to come.

TABLE OF CONTENTS

The Foundational Role of Semiconductors in Modern Economies ... 5

A Snapshot of Canada's Semiconductor Industry 7

Recent Transactions Shaping the Semiconductor Landscape 10

Overview of the Global Semiconductor Supply Chain 13

The Unique Value Proposition of Canada's Semiconductor Industry 18

Five Key Policy Recommendations 22

The Consequence of Policy Paralysis: Risks to Canada's National and Economic Security 27

A National Semiconductor Strategy for Canada 30

Forthcoming Research: Towards Canada's National Semiconductor Industry Strategy: An Economic Impact Analysis 37

About the Semiconductor Consortia 38

THE FOUNDATIONAL ROLE OF SEMICONDUCTORS IN MODERN ECONOMIES

SEMICONDUCTORS FORM THE BEDROCK OF THE MODERN GLOBAL ECONOMY.

Semiconductors are found in nearly all digital and technological devices, ranging from laptops and smartwatches to industrial robotics and automotives. They are foundational to the creation of essential and strategically important technologies that underpin the global economy, ranging from telecommunications and computing to automotive and advanced manufacturing machinery to consumer goods and data centres.

Semiconductors are critical inputs in emerging technologies and future-focused industries. In the rapidly growing clean tech sector, semiconductors are crucial in battery storage and various green technologies essential to achieving Canada's net-zero ambitions. Semiconductor technology also enables the creation of sensors that generate valuable data for artificial intelligence (AI) training and development, supporting advanced applications of AI in smart buildings, healthcare, and precision agriculture. Undergirding the digital economy is a network of Canadian-designed semiconductors that form the backbone of the modern internet, carrying internet traffic across the globe at near-light speeds and facilitating global connectivity and exchange.

As digital technologies become increasingly powerful, complex, and embedded in daily life, semiconductor devices must be continuously re-engineered to support evolving functionalities—underscoring the sector's dynamic and innovation-driven nature. The creation of new and advanced semiconductor devices is enabled by specialized electronic design automation (EDA) software, a subcategory of software used to model and design semiconductor chips. Canada is home to several leading EDA software companies, whose tools are used globally to develop the cutting-edge chips needed to power advanced technologies like AI and quantum.

In 2024, the global semiconductor market reached US$631 billion (C$883 billion), up 19.7% year over year.[1] With growing demand for advanced technologies such as AI, data centres and hyperscalers, and increased integration of digital products across consumer and industrial markets, demand is expected to reach US$1 trillion (C$1.4 trillion) by 2030.[2]

ESTABLISHING A RESILIENT SEMICONDUCTOR SUPPLY CHAIN PIPELINE IS ESSENTIAL FOR PROTECTING CANADA'S ECONOMY.

Large segments of Canada's economy are highly exposed to international semiconductor supply chain fluctuations and instability, including industries of strategic national importance such as the automotive, aerospace, and telecommunications sector. This is due to Canada's overwhelming reliance on imported semiconductor devices, primarily from countries facing increasing economic and geopolitical challenges. To secure its economy and protect its industries, Canada must act swiftly to establish a strong and resilient semiconductor supply chain.

Given the extensive range of applications for semiconductors, the variety of semiconductor typologies is vast and complex. Semiconductors are usually categorized by their function or by the type of circuitry involved in their design (digital, analog, or mixed). To understand the different types of semiconductors produced and used worldwide and to create standardized definitions for cross-functional data collection and analysis, the OECD developed a simplified taxonomy of semiconductor types.

1 World Semiconductor Trade Statistics, https://www.wsts.org/

2 Jeroen Kusters et al, "2025 global semiconductor industry outlook," Deloitte, February 4, 2025, https://www.deloitte.com/us/en/insights/industry/technology/technology-media-telecom-outlooks/semiconductor-industry-outlook.html

Table 1: A taxonomy of semiconductors by function and their applications.

Semiconductors by Function	Description	Example Devices	Example Applications
Logic integrated circuits	Logic integrated circuits perform functional operations and processing tasks used in every electronic device.	› Central processing units › Graphics processing units › Neural processing units › Microprocessor units › Microcontroller unit › Digital signal processors › Application-specific integrated circuits › Programmable logic devices › Field-programmable gate array › Programmable logic device	Performing calculations, processing data, managing data flows, handling complex graphics, deep learning and machine learning.
Memory integrated circuits	Memory integrated circuits are chips used to store and retrieve data and programs on computers and data storage devices.	Volatile memory › Dynamic random-access memory › Static random-access memory › Non-volatile memory NAND flash memory › Read-only memory › Non-volatile random access memory	Storing information that devices need to function and enabling information retrieval, such as running desktop applications or storing files.
Analog integrated circuits	Analog integrated circuits process environmental sensory data like sound, light, or temperature and convert them into digital signals for further processing.	› Voltage and current regulators › Operational amplifiers › Data converter integrated circuits › Audio amplifiers	Amplification, filtering, mixing, modulation, and demodulation.
Others	This broad category includes several discrete semiconductor typologies as well as complex semiconductors, such as system-on-a-chip (SOCs) and "chiplets".	› Optoelectronics and photonics › Sensors and actuators › Discrete semiconductors such as diodes or rectifiers › System-on-a-chip › Chiplets	A wide range of different and complex functions, from converting light into electronic signals to chips that combine multiple functions into a single monolithic die to discrete modular components that can be combined in diverse ways to perform unique and customizable functions.

Source: This table is based on a taxonomy produced by Chiraag Shah, Charles-Édouard Van de Put and Filipe Silva, "A taxonomy for semiconductor types," in Chips, Nodes, and Wafers: A Taxonomy for Semiconductor Data Collection, OECD (August 2024), 30. https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/08/chips-nodes-and-wafers_1189c2a2/f68de895-en.pdf.

A SNAPSHOT OF CANADA'S SEMICONDUCTOR INDUSTRY

As of 2020, Canada's semiconductor industry comprises approximately 561 firms generating a total of C$28.8 billion in total output, including C$16.3 billion in value added to the Canadian economy. Furthermore, despite its small size, Canada's semiconductor firms outpace others in the advanced manufacturing sector in R&D spend, the STEM intensity of their workforce, and average wages—representing a potent generator of economic revenue and future growth.

Despite its comparatively small size within Canada's overall economy, the importance of the sector cannot be understated: semiconductors are critical inputs into some of Canada's most important industries by employment and contribution to GDP, such as automotive, telecommunications, data centres and hyperscalers, and industrial automation. Canada's automotive sector alone directly supports over 100,000 jobs and indirectly supports an additional 603,500 jobs across Canada, while contributing over C$16 billion to Canada's GDP.[3] Semiconductors have a strategic role in powering Canada's digital infrastructure, manufacturing capabilities, and economic growth, making it indispensable to the broader economy.

OCCUPATIONS AND SALARIES

Wages in the semiconductor industry are higher than in other manufacturing sectors. This is primarily due to the high degree of STEM intensity in many of the sector's roles, including R&D personnel, technicians, and engineers. Typical occupations in Canada's semiconductor industry include Electrical/Electronics Engineers, Semiconductor Physicists, Process Engineers, IC Analog/Digital Design Engineers, Photonics Research, Fabrication and Packaging Technicians, and Software Engineers.

69,494
roles directly employed by firms in Canada's semiconductor industry.

26,494
additional roles were employed in supporting firms.

$8.7 billion
in direct and indirect labour income generated by the semiconductor industry.

$94,000
The average income of a worker directly employed in semiconductor industry.

$117,000
The average income of an employee working in R&D in semiconductor industry.

5.7
additional jobs created for every 1 semiconductor job.[4]

3 "Important Facts," Canadian Vehicle Manufacturers' Association, https://www.cvma.ca/industry/facts/
4 "2025 SIA Factbook," Semiconductor Industry Association, 2025, https://www.semiconductors.org/wp-content/uploads/2025/05/2025-SIA-Factbook-FINAL-1.pdf

RESEARCH AND DEVELOPMENT

Canada's semiconductor industry invests in research and development at a considerably higher rate than other advanced manufacturing industries. R&D investment generates significant social and economic returns. One study in Canada found that every dollar invested generates a return ranging from $8.09 to $18.49.[5] As such, understanding the R&D investments made by a given industry can shed important light on the indirect social and economic value generated by the industry. Moreover, the majority of R&D expenditures remain within Canada, generating significant domestic economic value.

$1.74 billion
spent on in-house R&D, approximately 1/10th of all in-house R&D spending in Canada.

$1.2 billion
on R&D spent in Ontario alone

$96.0 million
spent on outsourced R&D, with the majority (60.4%) of this work performed outside of Canada.

REVENUE AND TRADE

Canada is a net importer of semiconductor components and devices. This is primarily due to the dependence of other industries on advanced semiconductor components that Canada is unable to manufacture locally. For example, a CSC report found that Canada's domestic electric vehicle supply chain is heavily reliant on foreign suppliers, with each vehicle requiring up to C$2,000 in semiconductor parts.[6]

Semiconductor manufacturing is highly globalized and fragmented because each stage—from raw material sourcing to advanced chip fabrication—requires distinct expertise, infrastructure, and scale that only a few countries possess. As a result, large fabrication facilities and supply chains are concentrated outside Canada.

$8.6 billion
in gross value added directly by Canada's semiconductor production activities.

Additional
$3.5 billion
in gross value added through indirect sector activities.

$3.4 billion
in total exports, sent to 137 countries around the world.

$7.3 billion
in goods imported by the semiconductor industry, most of which originated in Asia and Oceania.

All figures as of 2020. Source: Thomas Wood, Greg Maloney, and Charlene Lonmo, "Chipping away at economic growth: Jobs, gross domestic product, and research in the semiconductor industry," Statistics Canada, November 10, 2023. https://www150.statcan.gc.ca/n1/pub/11-621-m/11-621-m2023016-eng.htm

DEFINING CANADA'S SEMICONDUCTOR INDUSTRY

Definitions of Canada's semiconductor industry vary significantly between reports. According to data collated under the North American Industry Classification System (NAICS), Canada is home to 476 semiconductor and electronics component firms. Other sources, such as Statistics Canada, adopt a more expansive definition, including firms that engage in semiconductor activities but whose primary activities fall under different NAICS codes.[7] The discrepancy is primarily attributable to the complex nature of the semiconductor industry: many large anchor firms in Canada operate across multiple electronics manufacturing industries, while others span numerous stages of the semiconductor value chain.[8]

---

5 See Benjamin F. Jones and Lawrence H. Summers, "A Calculation of the Social Returns of Innovation," NBER Working Paper 27863, September 2020, https://www.nber.org/papers/w27863 and "The Economic Impact of Applied Research at Canada's Polytechnics," Polytechnics Canada, August 2024, https://polytechnicscanada.ca/wp-content/uploads/2024/08/The-Economic-Impact-of-Applied-Research-at-Canadas-Polytechnics_pub.pdf

6 Kirk Ouellette, "Automotive Microchips Working Group Report," Canada's Semiconductor Council 2024, https://irp.cdn-website.com/e5abb5aa/files/uploaded/CSC_Automotive_Microchips_Report__final.pdf

7 See "Businesses – Canadian Industry Statistics, Semiconductor and other electronic component manufacturing – 3344," Innovation, Science, and Economic Development Canada, https://ised-isde.canada.ca/app/ixb/cis/businesses-entreprises/3344 and Thomas Wood, Greg Maloney, and Charlene Lonmo, "Chipping away at economic growth: Jobs, gross domestic product, and research in the semiconductor industry," Statistics Canada November 10, 2023, https://www150.statcan.gc.ca/n1/pub/11-621-m/11-621-m2023016-eng.htm

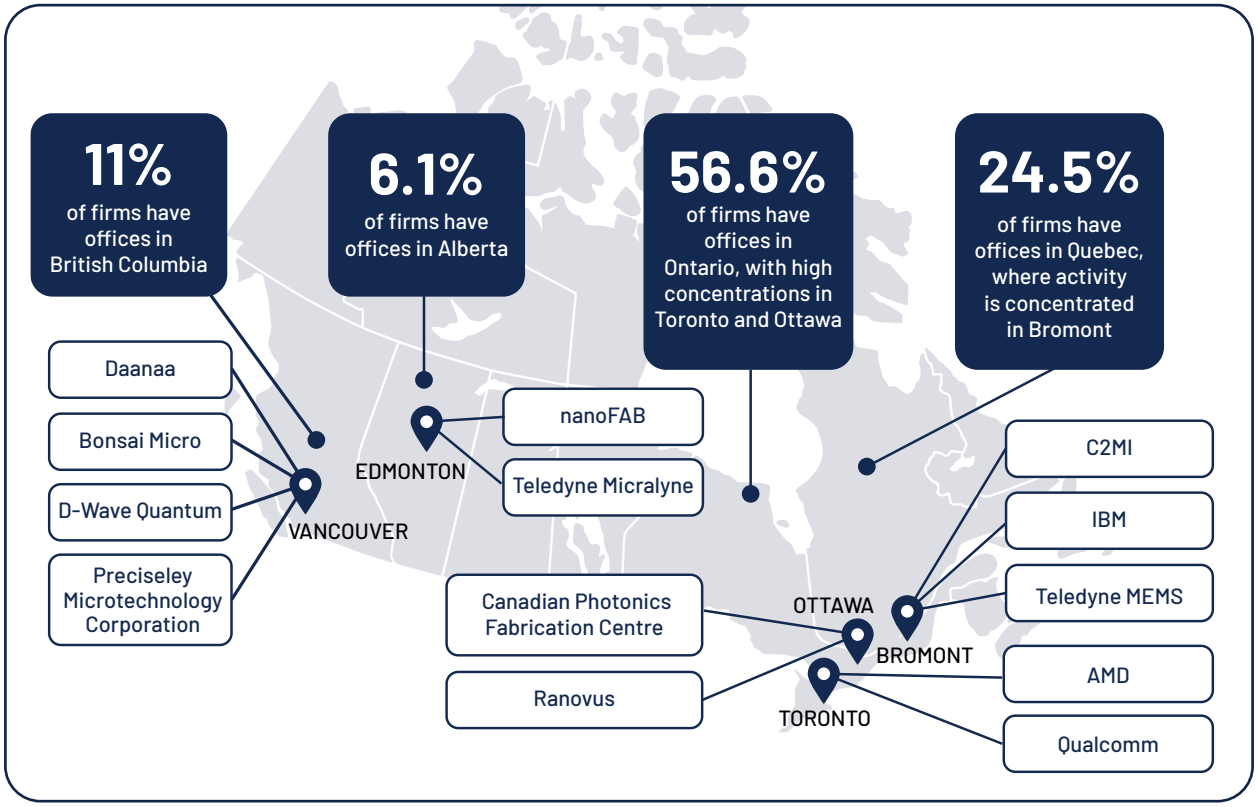
8 Erik Henningsmoen, Sheldon Lopez, and Mairead Matthews. Mapping Canada's Semiconductor Industry: Insights on Talent, Workforce Development, and Technological Strengths. Information and Communications Technology Council (ICTC), November 2025. Ottawa, Canada.

THE SEMICONDUCTOR VALUE CHAIN

The semiconductor value chain can be disaggregated into three stages:

i. design,
ii. fabrication, and
iii. assembly, testing, and packaging (ATP).

The **design stage** accounts for the majority of R&D expenditures.[9] During this stage, engineers and research scientists design new chips with the aid of electronic design automation (EDA) software tools; they may also incorporate IP cores for chip functions that can be licensed from semiconductor IP firms. Designers will also test the chip for functionality and may work closely with fabricators (fabs) to gauge production costs. During the **fabrication stage**, the finished designs are manufactured into microchips using an assortment of complex manufacturing processes, depending on the chip design, materials, and requirements. The **ATP stage** dices semiconductor wafers into individual chips, tests them, and packages them for inclusion into finished products. As the range of functions expected from digital devices increases, the role of advanced packaging—the process of combining multiple semiconductor components into a single package—becomes increasingly critical in enabling complex functionalities.



Source: Diagram generated from data produced by ICTC. See Erik Henningsmoen, Sheldon Lopez, and Mairead Matthews, "Mapping Canada's Semiconductor Industry: Insights on Talent, Workforce Development, and Technological Strengths," ICTC: November 2025. Ottawa, Canada.

9 The "design stage" of semiconductor value chains as used here refers only to activities directly tied to commercial product development. Research conducted by postsecondary institutions, while foundational, has been excluded from this stage because the value of such research is difficult to quantify due to its long-term, diffuse impact and the challenge of tracing specific innovations back to academic origins. Nonetheless, academic-industry partnerships remain essential, as they bridge the gap between theoretical breakthroughs and practical implementation, fostering innovation and sustaining the competitiveness of the semiconductor ecosystem.

RECENT TRANSACTIONS SHAPING THE SEMICONDUCTOR LANDSCAPE

In recent years, several high-profile international acquisitions of Canadian semiconductor firms have taken place. These transactions demonstrate the value placed on Canadian semiconductor firms by global investors and the immense value of the IP and talent housed within Canada's semiconductor industry. Three recent high-profile international acquisitions of Canadian semiconductor companies are outlined below:

Qualcomm acquires Alphawave Semi (2025): In June 2025, American semiconductor firm Qualcomm announced it will acquire Alphawave Semi for US$2.4 billion (C$3.37 billion).[10] Alphawave Semi is a global leader in connectivity, data transfer, and compute solutions for data centres and maintains a headquarters in Toronto and an R&D facility in Ottawa.

Infineon Technologies Acquires GaN Systems (2023): In 2023, the German semiconductor firm Infineon Technologies purchased Ottawa-based GaN Systems for US$830 million (C$1.17 billion).[11] GaN Systems offered compound semiconductor technology with important applications for power electronics, electric vehicle batteries and charging infrastructure, and clean energy applications.

Accenture Acquires XtremeEDA (2022): In 2022, global professional services firm Accenture purchased Ottawa-based XtremeEDA for an undisclosed amount.[13] XtremeEDA provided semiconductor design and verification services, and had experience designing chips for the telecommunications, aerospace, automotive, medical, and consumer electronics industries.[14]

These recent acquisitions underscore both the attractiveness and the vulnerability of Canada's semiconductor sector. Global firms are willing to invest heavily to access Canadian innovation, intellectual property, and highly skilled talent, affirming the country's reputation as a hub for advanced semiconductor technologies. At the same time, the frequency and scale of foreign takeovers highlight a structural risk: without robust domestic investment and strategic policy measures, Canada's most valuable semiconductor assets, talent, and intellectual property may continue to migrate abroad, limiting Canada's ability to capture long-term economic and technological benefits.

10 "Qualcomm to Acquire Alphawave Semi (press release)," Qualcomm, June 9, 2025, https://www.qualcomm.com/news/releases/2025/06/qualcomm-to-acquire-alphawave-semi.
11 "Compound semiconductor pioneer GaN Systems joins Infineon with close of $830-million USD acquisition," Betakit, October 25, 2023, https://betakit.com/compound-semiconductor-pioneer-gan-systems-joins-infineon-with-close-of-830-million-usd-acquisition/.
12 BDC, "Portfolio company: GaN Systems," accessed November 21, 2025, https://www.bdc.ca/en/bdc-capital/venture-capital/portfolio/gan-systems.
13 Accenture, "Accenture Completes Acquisition of XtremeEDA to Expand Silicon Design Capabilities in Canada and US (press release)", June 30, 2022, https://newsroom.accenture.com/news/2022/accenture-completes-acquisition-of-xtremeeda-to-expand-silicon-design-capabilities-in-canada-and-us.
14 ventureLAB, "XtremeEDA," accessed November 21, 2025, https://www.venturelab.ca/partners/xtremeeda.

A SWOT ANALYSIS OF CANADA'S SEMICONDUCTOR INDUSTRY

Strengths

- **Research & development and design:** Canada has cultivated a reputation for world-leading expertise in specialized areas of semiconductor research, development, and design.
- **Strong postsecondary institutions:** Canada's network of postsecondary and research institutions has the capacity to support cutting-edge research into high-value chips used in advanced technological applications, including AI and machine learning. Furthermore, establishing targeted postsecondary programs focused on semiconductor skills and occupations will enable Canada to build a pool of highly qualified professionals for the industry.
- **Specialized semiconductor devices:** Canada has unique strengths in small-volume, high-margin semiconductor devices, including photonics, optical communications, compound semiconductors, MEMS, advanced packaging, and chip design.
- **Rich mineral resources:** Canada has an abundant domestic supply of mineral resources used extensively in semiconductor manufacturing. Canada has begun advancing its critical minerals sector through the Canadian Critical Minerals Strategy, but to fully capitalize on these investments, they must be strategically aligned with downstream, value-added industries—such as semiconductors—that rely heavily on critical mineral inputs.
- **Presence of large anchor firms:** Canada is home to many large multinational semiconductor anchor firms who have established domestic footholds to leverage the nation's unique advantages, demonstrating the country's appeal to multinational firms. There is an opportunity to capitalize on foreign direct investment (FDI) by attracting strategic new anchor partners committed to investing in Canada and establishing deeper integration into global supply chains.

Weaknesses

- **Insufficient talent supply:** Canada's supply of semiconductor talent cannot meet industry demand in critical roles, resulting in high levels of competition for talent. Many Canadian firms report difficulty competing with larger firms and other high-paying domestic industries, like AI and software development, for top talent. Consequently, growing firms express their plans to either expand outside of Canada or hire remote workers to fill talent needs.[15]
- **Aging semiconductor workforce:** Canada's semiconductor workforce is aging, with one report forecasting that up to 20% of semiconductor workers could retire in the next 5 to 10 years.[16]
- **Shortage of founders and business leaders:** ICTC's report that mapped Canada's semiconductor industry found that some semiconductor industry leaders expressed concern about a decline in the number of semiconductor start-ups, due in part to an overreliance on technical skills and a lack of business acumen among the workforce.
- **Difficult immigration pathways:** Due to Canada's domestic talent shortages, semiconductor firms are hiring outside of Canada and focusing on the pool of international students enrolled in Canadian programs. However, recent changes to Canada's immigration levels and pathways could prove a barrier to talent mobility and recruitment in the future.
- **Lack of fabrication facilities:** A shortage of local fabrication, packaging, and test infrastructure slows down production timelines and hinders R&D cycles, presenting significant barriers to innovation and product development.
- **Lack of public awareness:** Public awareness of Canada's domestic semiconductor industry remains limited, despite its foundational role in the modern economy. This oversight contributes directly to talent shortages, particularly among emerging professionals who are unaware of the sector's career pathways and strategic importance, as well as for industry members who wish to advocate for the industry.
- **International Acquisitions:** Semiconductor start-ups and SMEs often drive innovation, agility, and specialized technological advancements, which are critical for maintaining a competitive edge. When acquired by foreign entities, Canada not only loses intellectual property and talent but also diminishes its ability to build a robust domestic supply chain and scale emerging technologies.

15 Canada's Semiconductor Council, "Strengthening Canada's Semiconductor Talent Pipeline for Global Competitiveness: Talent & Workforce Development Working Group Report 2025," June 2025, https://www.canadassemiconductorcouncil.com/chips-without-people-why-canadas-semiconductor-growth-depends-on-talent.

16 Canada's Semiconductor Council, ibid.

A SWOT ANALYSIS OF CANADA'S SEMICONDUCTOR INDUSTRY

OPPORTUNITIES

- **Improve education and career pathways:** Canada has a strong and diversified network of academic and training institutions capable of upskilling and reskilling workers to build a domestic supply of semiconductor expertise and professionals. Additionally, Canada's veteran semiconductor workforce can be leveraged to cultivate the next generation of workers through knowledge transfer and mentorship programs.
- **Develop a streamlined immigration pathway to capture highly-qualified professionals from international regions:** Canada has an opportunity to capitalize on other countries' changing visa and immigration pathways and to bring highly qualified international talent to Canada.
- **Deepen integration with semiconductor supply chains:** Rather than seeking semiconductor self-sufficiency, Canada can deepen its integration with global value chains to cement its position in the semiconductor space. Canada can partner with other leading semiconductor producing nations and emerging economies to leverage complementary resources, skills, and capabilities and facilitate knowledge exchange and collaboration.
- **Invest in R&D and semiconductor fabrication infrastructure:** Building out Canada's fab infrastructure can reduce R&D and product development timelines, stimulate innovation, and slow brain drain to competing nations by allowing talent to innovate and commercialize domestically. Enhancing existing facilities, such as the Canadian Photonics Fabrication Centre, and investing in infrastructure to support advanced packaging, compound semiconductors, and MEMS can cement Canada's position in the global semiconductor industry. By strategically investing in specialized fabrication facilities, Canada can optimize its capital investment while positioning itself as a leading producer of high-value advanced semiconductor components.
- **Establish regional innovation hubs:** Due to the concentration of semiconductor firms, talent, and research institutions in a handful of regions, Canada can leverage these existing networks to build robust talent and innovation hubs that can serve as catalysts for R&D, innovation, and commercialization and produce the next generation of transformational semiconductor firms. Canada can look to the European Chips Act for models.

THREATS

- **IP loss and IP theft:** Loss of intellectual property, whether through foreign acquisitions or from Canadian academic partnerships with multinational enterprises, poses a significant threat to Canada's semiconductor industry, as it can result in the transfer of critical technologies, undermine domestic innovation, and erode national control over strategic assets essential to economic and security interests. Additionally, IP theft through industrial espionage and cybersecurity breaches poses a threat to Canada's domestic semiconductor firms.
- **Trade, tariffs, and geopolitical tensions:** Ongoing tensions between major semiconductor producers, including the United States, China, and Taiwan, present a serious threat to the stability of Canada's semiconductor supply chain. As a net importer of semiconductors, Canada relies on stable access to international producers to sustain its domestic industries. Additionally, Canadian semiconductor firms rely on international fabs, like those in Taiwan, to prototype and produce Canadian-designed chips.
- **Competing international investments and industrial policies:** Large-scale government investments, such as the U.S.'s CHIPS and Science Act and the European Chips Act, pose a threat to Canada's semiconductor industry by accelerating global innovation, luring top talent and capital away from Canada, and displacing Canadian firms in critical technology markets.
- **Supply chain dependence:** Canada is almost entirely dependent on foreign suppliers of semiconductors used in significant sectors of the Canadian economy and high-priority growth sectors, including automotive manufacturing, AI data centres, cleantech, and aerospace and defence. Without securing its semiconductor supply chain, Canada could experience a significant degradation in the stability of sectors dependent on semiconductor, with the fallout impacting revenues, trade, national security, employment, and more.

OVERVIEW OF THE GLOBAL SEMICONDUCTOR SUPPLY CHAIN

THE GLOBAL SEMICONDUCTOR INDUSTRY BY MARKET SHARE

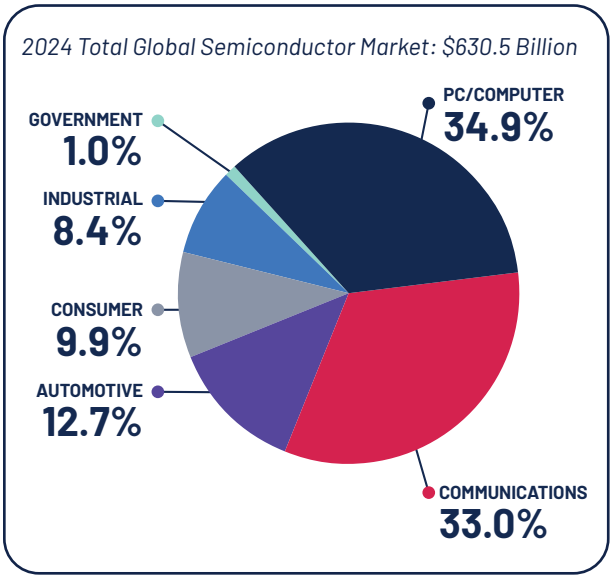
Five countries account for approximately 90.7% of the global semiconductor market.

UNITED STATES	SOUTH KOREA	JAPAN	TAIWAN	CHINA	EUROPEAN UNION
50.4%	**21.1%**	**8.2%**	**6.5%**	**4.5%**	**9.2%**
of the global market share	of the global market share	of the global market share	of the global market share	of the global market share	of the global market share

In 2024, the total global semiconductor market reached US$631 billion (C$883 billion), representing an 87.8% increase over the past decade.[17] Industry estimates forecast that the total global semiconductor market will exceed US$800 billion (C$1.12 trillion) by 2026, primarily driven by increased demand for AI applications and associated consumer demand and cloud/data centre infrastructure.[18,19]

Consumer-led products, such as laptops, smartphones, and automobiles, drive the majority of semiconductor demand.[20] These devices have led to heightened demand for certain types of semiconductors, including logic chips, memory chips, analog chips, and microprocessing units. Together, these four products accounted for nearly 80% of the global semiconductor industry's sales.[21]

2024 Total Global Semiconductor Market by Product Categories



17 "Global Semiconductor Market," World Semiconductor Trade Statistics, https://www.wsts.org/
18 2025 SIA Factbook.
19 Chris Gentle et al, "2025 Global Semiconductor Industry Outlook," KPMG, 2025, https://kpmg.com/kpmg-us/content/dam/kpmg/pdf/2025/global-semiconductor-industry-outlook-2025.pdf
20 2025 SIA Factbook.
21 2025 SIA Factbook.

TRENDS IN THE GLOBAL SEMICONDUCTOR MARKET

The COVID-19-induced global chip shortage (2020-2023) drew increased attention to the fragility and vulnerability of semiconductor supply chains, highlighting the importance of semiconductors to the global economy and the substantial global dependence on a handful of major source nations. Semiconductor shortages led directly to considerable price increases in consumer and industrial goods, from automotives to gaming consoles to household appliances.[22] This shortage compounded existing inflationary pressures post-pandemic.

More recently, shifting global trade dynamics—including heightened tensions between two of the world's major semiconductor suppliers, the U.S. and China—threaten to further destabilize semiconductor supply chains. As a result, countries and industry members are increasingly adapting their business operations to mitigate the risk of supply chain disruptions and to secure stable and reliable access to essential chips.[23]

Recent trends include:

Reshoring and Nearshoring: Rising concerns over tariffs, geopolitical instability, and the risk of export controls have prompted several major semiconductor firms to reconsider their manufacturing and production strategies. 40% of the companies surveyed reported that concerns about territorialism, tariffs, and trade restrictions are among the biggest issues facing the global semiconductor industry, with growing tensions between Taiwan and China and the U.S.'s increasing protectionism cited as the key concerns.[24] Firms are increasingly exploring regional diversification strategies, including reshoring and nearshoring, to mitigate the risks associated with volatile international trade policies and their dependence on foreign suppliers.[25]

Strategic Alliances (Friendshoring):[26] Amid rising geopolitical tensions and trade restrictions, countries are forming strategic alliances to strengthen supply chain resilience, facilitate knowledge exchange and transfer, and support technological sovereignty. For example, India, Japan, and South Korea are exploring a trilateral semiconductor partnership to leverage their complementary strengths and foster regional self-sufficiency.[27] South Korea has also established a partnership with the EU to intensify collaboration, foster technological advancements, and coordinate policy frameworks to secure supply chain resilience.[28] These strategic alliances aim to circumvent the volatility of U.S. trade policy and reduce dependence on China, while establishing avenues for deeper industrial and technological collaboration between allied nations.

22 Fernando Leibovici, Jason Dunn, "Supply Chain Bottlenecks and Inflation: The Role of Semiconductors," Federal Reserve Bank of St. Louis, December 16, 2021, https://doi.org/10.20955/es.2021.28

23 Gentle et al, ibid.

24 Gentle et al, ibid.

25 Reshoring refers to the practice of returning the production and manufacturing of goods back to a company's country of origin. Similarly, nearshoring refers to the practice of moving manufacturing operations to nearby countries.

26 Friendshoring refers to the practice of moving production and manufacturing operations to geopolitical allies.

27 The first exploratory meeting held between the three countries took place in October 2024. See Prateek Tripathi, "Semiconductors as the Spark for an India-Japan-South Korea Trilateral," Observer Research Foundation, October 16, 2025, https://www.orfonline.org/expert-speak/semiconductors-as-the-spark-for-an-india-japan-south-korea-trilateral

28 "Press Release: Chips JU and Republic of Korea Initiate Groundbreaking Semiconductor Collaboration," July 17, 2024, https://www.chips-ju.europa.eu/News-detail/?id=6b82b155-f643-ef11-a316-000d3a659853

Talent Development Hubs: Forecasted growth in the global semiconductor industry estimates that total industry revenues may exceed US$1 trillion (C$1.4 trillion) by 2030.[29] For perspective, the global telecommunications industry revenue in 2023 reached US$1.14 trillion.[30] To sustain this growth, it is estimated that the semiconductor industry will require an additional 1 million skilled workers worldwide—a 50% increase from 2021 staffing levels.[31] Governments and industry leaders are investing in place-based strategies that integrate education, workforce development, and infrastructure—such as the U.S. CHIPS Act and the EU Chips Skills Academy—to build localized ecosystems of innovation. These hubs emerge in regions like Arizona, Dresden, and Hsinchu, where partnerships between universities, technical colleges, and semiconductor firms are creating tailored training programs, apprenticeships, and reskilling initiatives.

Export Controls: Export controls on advanced semiconductor chips are reshaping the global semiconductor industry by introducing significant supply chain disruptions, strategic realignments, and geopolitical tensions. Measures led by the United States and its allies aim to restrict China's access to cutting-edge chip technologies and manufacturing equipment, citing national security concerns and the need to preserve technological leadership in areas like AI.[32] In response, China has imposed sweeping export controls on rare earth elements and permanent magnets, which are critical to chip production.[33] These restrictions have impacted global manufacturers by complicating access to essential materials and equipment.

AI and Automotive Chip Producers Dominate the Semiconductor Industry: Forecasted demand for AI chips is expected to exceed US$150 billion (C$209 billion) in sales in 2025, comprising 21.5% of total estimated global chip sales in 2025.[34] As a result, semiconductor firms with exposure to the AI and associated data centre market have witnessed explosive growth in market value, while firms serving other sectors, such as the consumer market, have experienced more muted growth. Similarly, demand for chips used in automotive applications is expected to increase due to greater electrification and digitalization of the automotive sector. It is estimated that the EV converter market will reach US$35 billion (C$49.4 billion) by 2029.[35] With large companies and countries investing heavily in continued data centre infrastructure, AI chip sales are expected to drive future growth of the semiconductor market.[36]

Reduced Inventory Levels and Pivot to Just-in-time Manufacturing: The supply chain challenges caused by the COVID-19 pandemic compelled semiconductor firms to increase inventory levels to mitigate supply chain disruptions. With the easing of pandemic-induced disruptions and the emergence of new economic challenges, semiconductor firms are pivoting back to a "just-in-time" approach to inventory management. It was found that 47% of semiconductor firms plan to reduce their on-hand inventory levels, with European firms expressing the greatest intention at 56%.[37]

29 Kusters et al, ibid.
30 "A new recipe for growth: Perspectives from the Global Telecom Outlook 2024-2028," PWC, March 2025, https://www.pwc.com/gx/en/industries/tmt/assets/pwc-perspectives-from-the-global-telecom-outlook-2024-2028.pdf
31 "The Global Semiconductor Talent Shortage," Deloitte, 2024, https://www.deloitte.com/us/en/Industries/tmt/articles/global-semiconductor-talent-shortage.html
32 Sujai Shivakumar, Charles Wessner, and Thomas Howell, "The Limits of Chip Export Controls in Meeting the China Challenge," Center for Strategic and International Studies, April 14, 2025, https://www.csis.org/analysis/limits-chip-export-controls-meeting-china-challenge
33 Gracelin Baskaran, "China's New Rare Earth and Magnet Restrictions Threaten U.S. Defense Supply Chains," October 9, 2025, https://www.csis.org/analysis/chinas-new-rare-earth-and-magnet-restrictions-threaten-us-defense-supply-chains
34 Kusters et al, ibid.
35 Ouellette, ibid.
36 Canada has also announced recent major investments to build its domestic AI data centre capacity. For example, the Canadian Sovereign AI Compute Strategy allocated $2 billion over five years to invest in public and commercial infrastructure to secure the compute capacity Canadian businesses and researchers need. See "Canadian Sovereign AI Compute Strategy," Innovation, Science, and Economic Development Canada, https://ised-isde.canada.ca/site/ised/en/canadian-sovereign-ai-compute-strategy
37 Gentle et al, ibid.

WHAT THESE TRENDS MEAN FOR CANADA

These trends have profound implications for Canada's semiconductor workforce, industry, and overall economy. The accelerated pace of reshoring, nearshoring, and friendshoring, for example, threatens to reshape historic supply chain relationships, while also opening opportunities to diversify Canada's trade partnerships and form new multilateral relations. Similarly, the cultivation of regional talent development hubs outside Canada may lure top junior Canadian talent away from the country. Meanwhile, the pivot to just-in-time production coupled with the rise of export controls further threatens to constrain Canada's access to semiconductor devices used in a wide range of domestic industries, including its automotive, aerospace, and defence sectors.

Examples of Focused National Semiconductor Initiatives

Although the United States, South Korea, Japan, Taiwan, China, and the European Union dominate the semiconductor industry, other countries are finding ways to strategically leverage their unique value propositions—from geographic position to human capital to talent and workforce development capabilities—to carve out a position in the semiconductor market. Examples of major national semiconductor initiatives include:



Netherlands: The Netherlands launched its National Technology Strategy in 2024, which identifies ten key enabling priority technologies. These include semiconductor technologies, optical systems and integrated photonics, and quantum technologies.

The Strategy outlines several ambitions for the development of each of these technologies. For semiconductors, the Netherlands aims to hold a leading position in chip design, production equipment and materials, and in test and packaging technologies by 2035. In support of these ambitions, the Strategy promotes several short- and medium-term activities to achieve these goals, including increased investment in research and test facilities, strengthening knowledge transfer between academia and industry, and developing and attracting top talent. The Strategy has been complemented by several major investments, including €2.51 billion (CA$4.1 billion) to Project Beethoven to enhance semiconductor infrastructure and talent in the Brainport Eindhoven region.[38]



Spain: Spain launched its Project for Strategic Economic Recovery and Transformation of the Chip sector (PERTE Chip) in 2022, as part of Spain's Recovery, Transformation, and Resilience Plan developed in the wake of the COVID-19 pandemic. PERTE Chip aims to develop Spain's semiconductor industry along the entire value chain, while leveraging the country's existing strengths. The plan is shaped around four axes, including boosting research, the establishment of fabless design companies, investing in the construction of a domestic foundry, and funding the creation of new start-ups, SMEs, and domestic scale-ups.

Spain committed €12.25 billion (CA$19.9 billion) through 2027 to support the strategy, which has to date mobilized more than €30 billion in public investment through Next Generation EU support.[39]

38 "National Technology Strategy: Building blocks for strategic technology policy," Ministry of Economic Affairs and Climate Policy, https://www.kia-st.nl/_asset/_public/__site_4/257-034_Nationale_Technologie_Strategie-EN_met_agenda.pdf; Project Beethoven 2024" Brainport Eindhoven, https://brainporteindhoven.com/en/strategy-organisation/agenda-with-the-government/project-beethoven-2024

39 Anne-Françoise Pelé, "Spain Approves €12.25b Semiconductor Investment Plan," EE Times Europe, May 25, 2022, https://www.eetimes.eu/spain-approves-e12-25b-semiconductor-investment-plan/; "PERTE: Strategic Projects for Economic Recovery and Transformation," España Digital 2026, https://espanadigital.gob.es/en/measure/perte-strategic-projects-economic-recovery-and-transformation

France: France's national semiconductor strategy, launched under the "Electronique 2030" initiative as part of the broader France 2030 investment plan, commits €5 billion (C$8.1 billion) in funding to boost domestic semiconductor manufacturing, research, and workforce development.



The strategy is built around three key pillars:

1. increasing manufacturing capacity,
2. supporting innovation and exploratory research, and
3. expanding education and training to meet future skills needs.

A major highlight includes the €5.7 billion (C$9.2 billion) joint investment by STMicroelectronics and GlobalFoundries to build a 300-mm wafer fab in Crolles, with €2.9 billion (C$4.7 billion) in public funding, targeting strategic sectors such as automotive, industrial, and IoT.

The strategy aims to mobilize €10 billion (C$16.2 billion) in combined public and private investment so far, involving over 15 industrial leaders and 150 partners. It is expected to result in more than a dozen new manufacturing facilities or production lines across France.[40]

India: India's Semiconductor Mission (ISM) is a strategic national initiative aimed at establishing India as a global hub for semiconductor design and manufacturing. Numerous factors, including a high dependency on semiconductor imports, the risk of global supply chain disruptions, and the accelerated pace of digital transformation within the country drove the development of the ISM.



The ISM allocated US$10 billion (C$14 billion) towards the development of a sustainable semiconductor manufacturing ecosystem in the country. Key objectives include formulating a comprehensive long-term national semiconductor strategy, building a secure supply chain, strengthening India's semiconductor design industry and start-up ecosystem, promoting the creation of intellectual property, and incentivizing technology transfer. Additionally, catalyzing research, commercialization, and skill development through national and international partnerships is another key objective.[41]

Ireland: Ireland's Silicon Island strategy, launched in May 2025, aims to position Ireland as a leading European hub for chip innovation and manufacturing, while supporting the EU Chips Act goal of producing 20% of global semiconductors by 2030. The plan focuses on three pillars: strengthening Ireland's existing semiconductor ecosystem to foster a vibrant environment for start-ups, SMEs, and MNEs; developing Ireland's skills pipeline to secure a steady supply of talent; and seizing new opportunities for international collaboration while attracting investment.



The strategy establishes several concrete goals, including scaling the domestic semiconductor workforce to 34,500 by 2040. The strategy also emphasizes research and innovation through initiatives like the I-C3 national competence centre (a consortium between University College Cork, Tyndall National Institute, MIDAS, and University College Dublin), participation in EU pilot lines, and collaboration with global players such as Intel, Analog Devices, and Qualcomm.[42]

United Kingdom: The UK's National Semiconductor Strategy, published in May 2023, outlines a 20-year vision to strengthen the country's position in semiconductor technologies by focusing on its core strengths in R&D, design and intellectual property, and compound semiconductors.



Backed by up to £1 billion (C$1.84 billion) in government investment over the next ten years, the strategy aims to grow the domestic sector, mitigate supply chain disruptions, and protect national security. Key initiatives include the launch of a UK Semiconductor Infrastructure Initiative, a new Semiconductor Advisory Panel, and support for start-ups, prototyping facilities, and talent development through doctoral training and technical qualifications. The strategy adopts a model that leverages the UK's niche capabilities and international partnerships.[43]

40 Anne-Françoise Pelé, "France Invests Over €5B in Semiconductors," EETimes, July 13, 2022, https://www.eetimes.eu/france-invests-over-e5b-in-semiconductors/; "France 2030 : Stratégie Électronique." Direction générale des Entreprises, October 18, 2024. https://www.entreprises.gouv.fr/priorites-et-actions/autonomie-strategique/soutenir-linnovation-dans-les-secteurs-strategiques-de-9.

41 "Vision and Objectives," India Semiconductor Mission, https://ism.gov.in/vision-and-objectives

42 "Silicon Island: Ireland's National Semiconductor Strategy," Department of Enterprise, Trade, and Employment, May 19, 2025, https://enterprise.gov.ie/en/publications/publication-files/silicon-island-a-national-semiconductor-strategy.pdf

43 "National Semiconductor Strategy," Department for Science, Innovation and Technology, May 19, 2023, https://www.gov.uk/government/publications/national-semiconductor-strategy/national-semiconductor-strategy

THE UNIQUE VALUE PROPOSITION OF CANADA'S SEMICONDUCTOR INDUSTRY

CANADA MUST CAPITALIZE ON ITS STRENGTHS TO DEVELOP A ROBUST SEMICONDUCTOR INDUSTRY.

Canada benefits from rich resources, both human and material, that are capable of sustaining a resilient semiconductor industry. With the right policy levers in place, Canada can establish itself as a critical node in the global semiconductor market and carve out a position that secures its economic prosperity and technological leadership—all while creating thousands of new jobs, attracting millions in private sector investment, and catalyzing its leadership in the specialized semiconductor space. To accelerate private sector investment, Canada must amplify its unique value proposition to the semiconductor industry, including:

1. Advanced research capabilities
2. Strong and dynamic postsecondary institutions and research facilities
3. Specialization in high-value segments
4. Access to critical minerals
5. Deep supply chain integration with larger markets, including the United States and Europe
6. Stable regulatory environment

Advanced Research Capabilities:
Canada's advanced research capabilities in semiconductor technologies offer a compelling value proposition for both public and private sector investment and global partnerships. Canada is home to over 53 dedicated research centres, like the Waterloo Institute for Nanotechnology (University of Waterloo), the Canadian Centre for Electron Microscopy (McMaster University), and Toronto Nanofabrication Centre (University of Toronto) plus hundreds of ecosystem firms, from multinational enterprises like Jabil, Nokia, and Teledyne to SMEs like Bonsai Micro and Ranovus.

These centres of excellence support cutting-edge research in compound semiconductors, photonics, MEMS, and quantum technologies—areas with high growth potential and strategic importance. Canadian semiconductor firms have increased R&D spending by 17% between 2020 and 2022, outpacing other industries and demonstrating a sustained commitment to innovation.

Federal initiatives such as the C$223 million FABrIC program by CMC Microsystems, backed by Innovation, Science and Economic Development Canada (ISED), further enhance Canada's research ecosystem by funding commercialization pathways, training programs, and collaborative projects across academia and industry. ventureLAB's Hardware Catalyst Initiative (HCI) is Canada's first and only incubator dedicated to hardware and semiconductor startups, serving as a transformative model for catalyzing domestic innovation in the semiconductor sector. HCI provides hardtech founders with access to prototyping and testing labs, specialized equipment, mentorship, and IP support, helping firms accelerate product development and commercialization.

This strong foundation of research excellence, combined with Canada's stable regulatory environment and skilled workforce, positions the country as a prime destination for semiconductor investment and a trusted partner in building resilient, next-generation technologies.

Academic Ecosystem:
Canada's academic ecosystem provides a strong foundation for semiconductor workforce development, offering a unique value proposition that enhances the country's global competitiveness and attractiveness to private sector investment. With over 35 universities offering electronic engineering programs—including top-ranked institutions such as the University of Toronto, University of Waterloo, and McGill University—Canada consistently produces highly qualified personnel in semiconductor design, fabrication, and systems engineering.

Specialized training initiatives, such as the FABrIC program by CMC Microsystems, are bridging the gap between academia and industry by providing hands-on learning, co-op placements, and targeted certifications aligned with market needs. According to the Canada Semiconductor Council's 2025 Talent & Workforce Development Report, 70% of Canadian semiconductor firms plan to double in size over the next five years, with talent availability cited as the most critical factor for growth.[44]

Canada's inclusive education policies, streamlined immigration pathways for international students, and commitment to equity in STEM fields further strengthen its position as a reliable and innovation-driven partner in building a resilient global semiconductor workforce.

44 "Strengthening Canada's Semiconductor Talent Pipeline for Global Competitiveness," Canada's Semiconductor Council, 2025, https://irp.cdn-website.com/e5abb5aa/files/uploaded/Talent+-+Workforce+Development+Working+Group+Report_final-1f758c22.pdf

Specialization in High-Value Segments:
Canadian firms have a competitive edge in specialized, high-value segments of the semiconductor market, including advanced packaging, analog- and mixed-signal semiconductor technology, ASICs, photonics and optical communications, MEMS, and compound semiconductors. These chips are critical for advanced applications, including 5G, AI, IoT, autonomous vehicles, and quantum. An industrial strategy centred on these specialized segments could position Canada as a global leader in enabling next-generation technologies through targeted investment, talent development, and strategic partnerships.

As demand for these technologies grows, so too will demand for specific chips and devices. The advanced packaging market alone reached US$46 billion (C$64.7 billion) in 2024, up 19% year-over-year, and is expected to grow to US$79.4 billion (C$111.1 billion) by 2030—a cumulative annual growth rate (CAGR) of 9.5%.[45] Demand for silicon photonics is also expected to grow rapidly, driven by data centre expansion and the widespread adoption of 5G technologies. Yole Group estimates that the market for silicon photonic integrated circuits will exceed US$863 million (C$1.21 billion) by 2029, a robust 45% CAGR.[46] Canada has distinct strengths in these segments, driven by growing demand and key infrastructure such as the Canadian Photonics Fabrication Centre.

Access to Critical Minerals:
Canada's abundant reserves of critical minerals—such as silicon, gallium, germanium, indium, and rare earth elements—provide a unique and strategic advantage in the global semiconductor supply chain.[47] Critical minerals are essential for the fabrication of both silicon-based and compound semiconductors, which underpin advanced technologies including AI, quantum computing, and 5G infrastructure. According to Natural Resources Canada, Canada holds some of the largest known reserves of rare earth oxides globally, and is the fourth-largest producer of indium, a key input in semiconductor and advanced vehicle manufacturing.[48]

The Canadian Critical Minerals Strategy prioritizes the development of high-purity minerals and processing capacity to support semiconductor innovation, with initiatives led by the Critical Minerals Centre of Excellence at Natural Resources Canada and supported by $1.5 billion in federal funding through the Critical Minerals Infrastructure Fund.[49] Projects such as the Nechalacho rare earth mine in the Northwest Territories and the Saskatchewan Research Council's commercial-scale refinery are advancing domestic capabilities in extraction and processing, reducing reliance on China, which currently controls over 90% of global refining capacity. [50]

By leveraging its resource wealth, environmental governance, and integrated trade relationships, Canada is well-positioned to attract private sector investment and become a reliable supplier of critical inputs for the semiconductor industry.

45 "Advanced packaging market set to reach $79.4 billion in 2030," Yole Group, August 31, 2025, https://www.yolegroup.com/press-release/advanced-packaging-market-set-to-reach-79-4-billion-by-2030/

46 "Silicon photonics: accelerating growth in the race for high-speed optical interconnects," Yola Group, December 12, 2024, https://www.yolegroup.com/press-release/silicon-photonics-accelerating-growth-in-the-race-for-high-speed-optical-interconnects/

47 Shaz Merwat, "The New Great Game: How the race for critical minerals is shaping tech supremacy," RBC, March 10, 2025, https://www.rbc.com/en/thought-leadership/the-trade-hub/the-new-great-game-how-the-race-for-critical-minerals-is-shaping-tech-supremacy/; "The Canadian Critical Minerals Strategy," Natural Resources Canada 2022, https://www.canada.ca/content/dam/nrcan-rncan/site/critical-minerals/Critical-minerals-strategyDec09.pdf

48 "Market Snapshot: Critical Minerals are Key to the Global Energy Transition," Canada Energy Regulator, January 18, 2023, https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2023/market-snapshot-critical-minerals-key-global-energy-transition.html

49 "Critical Minerals Infrastructure Fund," Natural Resources Canada, https://www.canada.ca/en/campaign/critical-minerals-in-canada/federal-support-for-critical-mineral-projects-and-value-chains/critical-minerals-infrastructure-fund1.html

50 Gracelin Baskaran, "China's New Rare Earth and Magnet Restrictions Threaten U.S. Defense Supply Chains," October 9, 2025, https://www.csis.org/analysis/chinas-new-rare-earth-and-magnet-restrictions-threaten-us-defense-supply-chains

Deep supply chain integration with larger markets: Canada's deep integration into North American and global semiconductor supply chains provides a significant competitive edge in attracting private sector investment and funding. As a trusted trade partner with preferential access to 51 countries through 15 free trade agreements—including the Canada-United States-Mexico Agreement (CUSMA) and the Comprehensive Economic and Trade Agreement (CETA) with the EU—Canada offers semiconductor firms seamless market entry and tariff-free access to nearly 1.5 billion consumers.[51]

In 2020, Canada's semiconductor industry exported C$3.4 billion globally to 137 countries. The U.S. was the primary destination, accounting for 61.2% of industry exports.[52] Despite U.S. trade volatility and the implementation of new global tariffs, semiconductors remain exempt from additional tariffs under CUSMA.[53] Canada's strategic location, reliable infrastructure, and collaborative trade posture make it a valuable partner in global efforts to diversify supply chains and mitigate geopolitical risk. Recent initiatives—such as the FABrIC network and joint research with European and Asian partners—further embed Canada into international innovation ecosystems, enhancing its attractiveness to firms seeking resilient, scalable, and geopolitically stable production and R&D environments.

Stable regulatory environment: Canada's stable regulatory environment and strong democratic institutions make it an increasingly attractive destination for semiconductor firms seeking long-term security and predictability in a volatile global landscape.

As geopolitical tensions escalate—particularly between Taiwan, where over 90% of the world's most advanced chips are produced, and China—the risk of supply chain disruption has become a pressing concern for governments and industry leaders worldwide.[54] Simultaneously, the U.S.' growing protectionist measures, including export controls and domestic content requirements under the CHIPS and Science Act, have introduced uncertainty for foreign firms operating in or trading with the U.S.

Canada offers a rules-based, transparent business climate, underpinned by robust intellectual property protections, open trade policies, stable political environment, and deep integration with allied economies. These attributes, combined with Canada's commitment to multilateral cooperation and its expanding semiconductor R&D and manufacturing ecosystem, position the country as a reliable and geopolitically neutral partner for firms looking to diversify operations and mitigate risk in an increasingly fragmented global semiconductor supply chain.

51 "Canada's free trade agreements," Trade Commissioner Service, https://www.tradecommissioner.gc.ca/en/market-industry-info/free-trade-agreements.html

52 Wood et al, ibid.

53 Zvi Halpern-Shavim, Brady Gordon, Elena Balkos, "Canada-U.S. Tariffs: Where Do We Stand in a Shifting Trade Environment?," Blake, Cassels & Graydon LLP, April 11, 2025, https://www.blakes.com/insights/canada-u-s-tariffs-where-do-we-stand-in-a-shifting-trade-environment/

54 Karen Hui, "Taiwan, Canada, and the Global Semiconductor Race," Asia Pacific Foundation of Canada, February 10, 2025, https://www.asiapacific.ca/publication/taiwan-canada-and-global-semiconductor-race

FIVE KEY POLICY RECOMMENDATIONS

1 **Canada should significantly increase public R&D investment in the semiconductor industry to catalyze private-sector growth and attract FDI, positioning the country as a globally competitive innovation hub.**

Canada must scale its R&D investments to prioritize strategically significant industries like semiconductors. Public R&D investments canfoster closer collaboration between industry partners and associations, thereby strengthening Canada's semiconductor industry ecosystem and supply chain. Furthermore, public R&D investment should be leveraged to catalyze private-sector and FDI, attracting and establishing anchor firms capable of sustaining and growing Canada's semiconductor industry.

Countries around the world are investing heavily in public sector R&D funding to boost their semiconductor industries and reaping substantial private-sector investment in return. Smaller players such as Malaysia and India have attracted substantial FDI in their domestic semiconductor industries. For example, since launching its National Semiconductor Strategy in May 2024 with a R25 billion (C$8.31 billion) financial commitment, Malaysia has secured RM63 billion (C$20.94 billion) in semiconductor investments as of March 2025, RM58 billion (C$19.27 billion) of which stemmed from foreign investors and RM5 billion (C$1.67 billion) from domestic companies.[55]

In India, the launch of the Indian Semiconductor Mission in 2021 has galvanized substantial investments from major domestic and international firms, from a US$10 billion (C$14 billion) fab investment by Tata Electronics Private Limited to a US$2.75 billion (C$3.85 billion) investment from Micron Technology to set up an assembling, testing, marking, and packing plant (ATMP).[56]

To the south, the U.S. CHIPS and Science Act committed US$52.7 billion (C$73.7 billion) in federal funding to boost domestic semiconductor research and manufacturing. Since its announcement, the Act has unleashed more than US$540 billion (C$755.5 billion) in new U.S. private-sector semiconductor investments.[57]

Canada can leverage its existing semiconductor research hubs to concentrate R&D funding and promote regionalization and specialization. Such funding programs could include support for regional innovation clusters that integrate research institutions, startups, anchor firms, investors, and other ecosystem actors. These regional innovation clusters could leverage existing specializations and facilities, such as the Ottawa's Canadian Photonics Fabrication Centre, Bromont's specialization in MEMS, and ventureLAB's prototyping and testing labs in Markham.

Direct public investments in semiconductor R&D and chip design, coupled with the establishment of commercial fabrication facilities, can rewrite Canada's economic story and transform its economy from a resource extraction-based model to a high-value-added economic powerhouse.

55 Justin Lim and Izzul Ikram, "Malaysia secures over RM63b investments under National Semiconductor Strategy — Anwar," The Edge Malaysia, 24 July 2025, https://theedgemalaysia.com/node/763905

56 Konark Bhandari, "India's Semiconductor Mission: The Story So Far," Carnegie Endowment for International Peace, August 25, 2025, https://carnegieendowment.org/research/2025/08/indias-semiconductor-mission-the-story-so-far?lang=en

57 "SIA Welcomes Legislation to Strengthen U.S. Semiconductor Manufacturing Credit," Semiconductor Industry Association, May 1, 2025, https://www.semiconductors.org/sia-welcomes-legislation-to-strengthen-u-s-semiconductor-manufacturing-credit/

2 Canada should build its domestic semiconductor fabrication and packaging capacity by designating such capital investments as Major Projects initiatives, framing it as a nation-building effort to secure technological sovereignty, strengthen economic resilience, and position the country as a strategic partner in the global semiconductor ecosystem.

Canada should invest in domestic semiconductor fabrication infrastructure (fab) and packaging facilities as a designated Major Projects initiative, framing it as a nation-building effort to secure technological sovereignty, strengthen economic resilience, pursue new high-growth innovation-driven opportunities, and position the country as a strategic partner in the global semiconductor ecosystem.

Canada currently lacks large-scale fabrication facilities capable of producing advanced semiconductor technologies. The absence of domestic fabrication infrastructure hinders workforce development, as students and early career professionals lack access to real-world hardware in which to apply their training and knowledge. At the same time, firms face prolonged R&D cycles due to delays in overseas prototyping. Smaller firms, in particular, struggle to engage with high-volume fabs abroad, limiting their ability to scale.

Given the density of fabs in established semiconductor suppliers like the United States and Taiwan, as well as the extraordinary cost of a state-of-the-art silicon fab for cutting-edge nodes, Canada should leverage its existing strengths in compound and photonic semiconductors and advanced packaging to carve out its competitive advantage. These technologies prioritize performance characteristics such as high electron mobility, thermal conductivity, and energy efficiency, rather than transistor miniaturization. A fab focused on these areas would be significantly less expensive to build and operate, while still delivering strategic value and enabling Canada to sustain a domestic supply of critical semiconductors.

In addition to fabrication facilities, Canada should invest in establishing domestic advanced packaging facilities and capabilities. As chip design and fabrication become increasingly globalized, advanced packaging—where multiple chips are integrated into a single system—has emerged as a strategic chokepoint in the semiconductor value chain. Canada already has substantial strengths in the advanced packaging sub-industry, including the largest advanced packaging facility in North America at IBM Bromont in Quebec. Leveraging these strengths to capitalize on the explosive growth expected in this field will help Canada carve out a unique and stable position within global semiconductor supply chains.

Jurisdictions with comparable strengths in these technologies include the United States, Japan, China, and the European Union. Canada possesses many of the key attributes needed to attract and sustain such infrastructure, including a highly skilled workforce supported by a world-class education and training system, abundant freshwater resources, reliable energy and transportation infrastructure, a stable regulatory environment, and a dynamic, innovation-driven technology sector.

The newly established Major Projects Office provides a timely and appropriate mechanism to support the development of a domestic fab and advanced packaging facilities, aligning with Canada's broader strategic investments, such as the C$2 billion Sovereign AI Compute Strategy. Domestic facilities would preserve the security and resilience of its semiconductor supply chain, insulating domestic industries that rely heavily on imported chips from global chip shortages caused by geopolitical instability, export controls, shifting trade alliances, and supply chain disruptions. Domestic facilities would also create thousands of high-paying direct and indirect jobs, while serving as a hub for suppliers, researchers, and supporting firms to co-locate and collaborate.

Beyond economic benefits, a domestic fab and advanced packaging facility would strengthen Canada's scientific and industrial base, enabling the country to keep pace with technological advances in leading economies across the Asia-Pacific, Europe, and North America.

A domestic fab and advanced packaging facility would also act as a magnet for Canadian and international semiconductor design and manufacturing talent, reinforcing the country's position as a leader in advanced technology and manufacturing. Framing this initiative as a nation-building project would catalyze public-sector funding and define the future of Canada's economic and technological landscape, diversifying trade relationships, opening new markets, and reinforcing Canada's role as an energy and critical minerals superpower. The foundational role of semiconductors across industries, from automotive and telecommunications to AI and clean tech, underscores the urgency and strategic importance of this investment as a matter of national economic security.

3 Canada should invest in targeted training programs that align postsecondary graduates with the evolving needs of the semiconductor industry, generating a skilled and dynamic workforce pipeline capable of supporting domestic R&D, innovation, and long-term sector growth.

Canada's semiconductor workforce is aging, and there is a lack of young talent being trained to step into critical roles in R&D, fabrication, engineering, and more. Although Canada has world-leading academic researchers and institutions, Canada isn't producing enough highly-skilled digital talent needed to sustain the growth of its domestic semiconductor industry.

It is anticipated that the global semiconductor industry will need an additional 1 million workers by 2030.[58] In Canada, 70% of Canadian semiconductor firms expect to double in size within 5 years, with one survey indicating an additional 5,000 engineers will be needed by 30 companies alone.[59] A lack of technicians to fill critical roles in automated systems, quality control, and production support also threatens the stability and resilience of Canada's semiconductor industry.

The wage gap between Canada and the U.S. further exacerbates Canada's talent shortage. While the average semiconductor worker in Canada earned C$94,000 in 2020, or C$117,000 for a worker in the industry's R&D segment[60], their counterparts in the U.S. earned an average of US$170,000 (C$237,837) in 2020.[61] The significant wage disparity contributes to a persistent "brain drain" of Canada's top talent to U.S. firms, making it difficult for small and medium-size enterprises (SMEs), which comprise 68.1% of Canadian semiconductor firms, to recruit highly qualified personnel.[62]

Canada must make strategic investments in its semiconductor talent pipeline to address the labour shortage and build capacity for both its large multinational firms and its SMEs to grow and compete in the global marketplace. Recent initiatives, like FABrIC by CMC Microsystems, are seizing the moment to train the highly qualified personnel Canada needs. FABrIC, launched with support from the Strategic Innovation Fund, will enable the training of 25,000 students and 1,000 professors over five years.[63] While industry-led initiatives like FABrIC play an important role shaping the future of the industry, Canada's investment in talent must go further if it is to compete with other emerging nations. Talent investment and development strategies could include:

i. Increasing support for advanced postgraduate programs at the Master's and Doctoral level, including work-integrated and experiential learning opportunities with semiconductor firms. This approach can generate a pipeline of highly qualified personnel who are Canadian citizens and permanent residents and are specifically needed for positions involving sensitive IP and national security, while also attracting top international students capable of bringing best practices and fostering strategic multilateral alliances.[64]

ii. Developing a Semiconductor Industry Certification curriculum to rapidly upskill and reskill new graduate and early-career professionals. The Semiconductor Industry Certification can fill immediate labour shortages by equipping recent graduates and early-career professionals with the specific skills needed by the semiconductor sector. This would also reduce the onboarding and training burden for companies while accelerating workforce readiness and enabling SMEs to unlock another pool of talent.[65]

iii. Adopting a skills-based approach to workforce development, prioritizing in-demand skills required by Canada's semiconductor industry. A report by CSC found that in-demand skills required by Canada's semiconductor industry, such as skills in Analog Design (High Speed), Systems Engineering, and Advanced Physical Layout are in critical shortages.[66] Similarly, specialized technologies such as photonics, quantum, and MEMS require targeted training initiatives. Other technology skills—such as Python, Linux, Git, TCL, MATLAB, and machine learning—are among the most frequently requested technical proficiencies in semiconductor job postings. Hardware and instrumentation skills—including electronic assembly, rework, testing, and familiarity with tools such as oscilloscopes, spectrum analyzers, and signal generators—are the next group of skills most in demand by semiconductor firms.[67]

58 Deloitte, ibid.
59 "Strengthening Canada's Semiconductor Talent Pipeline for Global Competitiveness," Canada's Semiconductor Council, 2025, https://irp.cdn-website.com/e5abb5aa/files/uploaded/Talent+-+Workforce+Development+Working+Group+Report_final-1f758c22.pdf
60 Wood et al, ibid.
61 "The U.S. Semiconductor Industry Workforce," Semiconductor Industry Assocation, https://www.semiconductors.org/wp-content/uploads/2022/02/The-US-Semiconductor-Industry-Workforce.pdf
62 Henningsmoen et al, ibid.
63 Gord Harling, "From Quiet Strength to Global Leadership: This is Canada's Semiconductor Moment," The Future Economy, September 2, 2025, https://thefutureeconomy.ca/op-eds/from-quiet-strength-to-global-leadership-this-is-canadas-semiconductor-moment/
64 Canada's Semiconductor Council, ibid.
65 Canada's Semiconductor Council, ibid.
66 Canada's Semiconductor Council, ibid.
67 Henningsmoen et al, ibid.

4 Canada should foster and nurture strategic alliances and international collaboration with allied nations in the semiconductor industry to strengthen supply chain resilience, diversify trade, accelerate innovation, and ensure access to critical technologies and new markets.

Canada should focus its semiconductor strategy on improved integration with global value chains and establish multilateral partnerships with allied nations. By deepening partnerships with countries such as Japan, South Korea, Germany, and other European Union members with strong domestic semiconductor capabilities, Canada can leverage complementary strengths in advanced manufacturing, R&D, and workforce development. These alliances will help Canada integrate into trusted global value chains, reduce dependency on geopolitically sensitive regions, diversify its trade relationships outside of its primary dependence on the U.S., and position itself as a reliable contributor to the collective semiconductor capacity of democratic nations.

Canada's regulatory reliability, democratic governance, and advanced technological capabilities in chip design, photonics, MEMs, and compound semiconductors make it an indispensable partner in global efforts to secure critical technologies. Canada has already taken meaningful steps to deepen international collaboration. The Memorandum of Understanding between the National Research Council of Canada and the UK's CSA Catapult and Quebec-based MiQro Innvation Collaborative Centre (C2MI) aims to build a resilient semiconductor supply chain across G7 nations, focusing on compound semiconductors and advanced packaging.[68] Similarly, Canada's participation in the G7 Semiconductor Point-of-Contact Stakeholder Forum and trade missions to South Korea, Taiwan, Germany, and Japan reflect a growing commitment to shared innovation and supply chain diversification.[69]

Canada can further leverage existing trade agreements such as the Comprehensive Economic and Trade Agreement (CETA) with the European Union, the Canada-Korea Free Trade Agreement, and the Canada–EU Digital Partnership to facilitate joint R&D, talent mobility, and infrastructure sharing. These frameworks provide a foundation for bilateral and multilateral cooperation in emerging technologies, including AI, quantum computing, and advanced manufacturing.

By embedding itself in international innovation platforms like Horizon Europe and Eureka, and aligning with trusted partners on workforce development and technology standards, Canada can amplify its global influence and attract FDI. Strategic collaboration will not only mitigate risks from supply chain disruptions and protectionist policies but also position Canada as a key contributor to the semiconductor alliances shaping the future of global technology.

68 "Canada and UK partner to build a stronger semiconductor supply chain," National Research Council Canada, July 3, 2025, https://www.canada.ca/en/national-research-council/news/2025/07/canada-and-uk-partner-to-build-a-stronger-semiconductor-supply-chain.html

69 "G7 Representatives Gather in Markham and Toronto to Strengthen Global Semiconductor Partnerships," ventureLAB, June 4, 2025, https://www.venturelab.ca/news/g7-representatives-gather-in-markham-and-toronto-to-strengthen-global-semiconductor-partnerships

5 Canada should implement targeted regulatory and procurement support to strengthen its domestic semiconductor industry, reinforce multilateral strategic alliance, and protect its intellectual property.

Regulatory modernization, such as streamlining permitting processes, clarifying export controls, and harmonizing standards with allied nations, will reduce barriers to private investment and facilitate cross-border collaboration. For example, Canada's recent updates to its Export Control List for quantum and advanced semiconductor technologies reflect a growing alignment with U.S. and EU frameworks, helping Canadian firms navigate international compliance and participate in secure supply chains.

Strategic procurement policies can also provide an opportunity to drive domestic semiconductor production, design, and manufacturing capabilities. In line with Canada's new Buy Canadian Policy to prioritize Canadian suppliers, Canada can use strategic procurement policies to mandate the use of Canadian-designed or Canadian-made chips and components in public sector applications and technologies, thus generating demand for domestic semiconductor suppliers, anchoring domestic production, and building out Canada's semiconductor infrastructure and capacity. Projects like CMC Microsystems' FABrIC provide a framework for such strategic procurement initiatives. Since its initial funding round in 2024, the FABrIC program has already leveraged $13.4 million in public sector funding to secure $35.6 million in total investments into the development of new semiconductor products and manufacturing capabilities.[70]

Additionally, Canada should consider introducing capital gains exemptions for Canadian semiconductor companies and targeted tax credits to incentivize investment in R&D, manufacturing, and commercialization. These fiscal measures would reduce barriers to scaling innovation and attract private capital. Additionally, Canada can adapt the flow-through shares model—successfully used in other industries, such as mining, oil and gas, and the energy sector—to allow investors to deduct eligible expenses incurred by semiconductor firms, thereby unlocking early-stage financing and fostering a more robust innovation pipeline.

By streamlining permitting processes, offering tax and R&D incentives, and aligning procurement policies with national semiconductor and advanced technology priorities—such as Canada's Sovereign AI Compute Strategy—Canada can accelerate the development of its domestic fabrication infrastructure, advanced packaging, and R&D capabilities. Public procurement can be used as a strategic lever to stimulate demand for Canadian-made semiconductor technologies, particularly in defence, telecommunications, and clean energy sectors that require higher degrees of security.

Furthermore, aligning regulatory frameworks with those of allied nations—such as through the Canada–EU Digital Partnership, CETA, and the Canada-Korea Free Trade Agreement—will facilitate cross-border collaboration, joint ventures, and technology transfer. These measures will not only enhance Canada's competitiveness but also embed it more deeply in trusted global supply chains, supporting shared innovation and economic resilience among democratic partners.

Additionally, providing support for domestic commercialization in the semiconductor industry can include protecting the industry's intellectual property from foreign actors. Through the Policy on Title to Intellectual Property Arising Under Crown Procurement Contracts, the Government of Canada establishes clear guidelines for ownership and licensing of IP developed through public contracts, ensuring that contractors retain commercialization rights while the Crown secures usage rights for public purposes. This framework promotes innovation while protecting sensitive technologies from unauthorized use or foreign acquisition. These types of strategic procurement and IP policies are particularly vital in the semiconductor industry, where IP theft and cyber-espionage are growing risks amid global geopolitical tensions. By aligning procurement and regulatory mechanisms with robust IP protections, Canada can foster a secure innovation environment, attract high-value investment, provide assurances to semiconductor firms, and ensure that domestically developed semiconductor technologies remain under Canadian control.

70 "Accelerating Canada's Semiconductor Industry," FABrIC, June 26, 2025, https://fabricinnovation.ca/accelerating-canadas-semiconductor-industry/

THE CONSEQUENCE OF POLICY PARALYSIS:

RISKS TO CANADA'S NATIONAL AND ECONOMIC SECURITY

Given the integral nature of semiconductors to critical sectors of Canada's economy, Canada must mobilize quickly to secure its position within the global semiconductor supply chain.

Canada has a generational opportunity to accelerate its economy through leadership in advanced manufacturing, clean tech, AI, and other emerging and fast-growing sectors. Canada's unique strengths in specialized semiconductor devices, like compound semiconductors, optical components, and advanced packaging, give it a competitive advantage. It is time for Canada to leverage this advantage to establish the country's leadership in high-value semiconductor technologies.

ECONOMIC AND TECHNOLOGICAL RISKS

Canada's economy is already struggling with low labour productivity rates, severe talent shortages in critical STEM occupations, sluggish adoption of AI and advanced technologies, and innovation inertia. New trade disputes with major trading partners further threaten to stifle Canada's economic growth. Furthermore, Canada's reliance on foreign producers of semiconductors to supply the chips needed for essential industries is a liability to its capacity to deliver on the nation-building projects it has identified as crucial to its sovereignty and resilience.

Establishing a national semiconductor strategy is a vital step to diversifying Canada's economy and building resilience in the face of rapidly changing economic conditions. If Canada does not act quickly to secure its domestic semiconductor industry, it will face severe economic and technological repercussions that undermine its long-term prosperity and global competitiveness.

1. **Talent Drain and Innovation Gaps:** Canada's world-class research and academic institutions and its highly skilled STEM workforce are in high demand, both domestically and internationally. However, without sustained and targeted investment to build a domestic semiconductor industry capable of capitalizing on this workforce, Canadian talent may relocate to jurisdictions with stronger semiconductor ecosystems. Furthermore, international acquisitions of Canadian start-ups and SMEs further exacerbate the risk of talent drain and loss of innovative capacity. As a consequence, Canada will not only lose the talent it needs to build its semiconductor base but also the innovation and dynamism such talent brings to its digital ecosystem.

2. **Loss of Intellectual Property:** In the absence of a robust domestic semiconductor ecosystem, Canadian-made innovations risk being commercialized and scaled abroad. Without strategic support for local design and manufacturing, intellectual property developed in Canada may be transferred or acquired by international jurisdictions, undermining national economic returns and weakening Canada's position in global technology value chains. IP loss through foreign acquisitions, theft, and R&D partnerships with multinational enterprises not only diminishes Canada's ability to capture the full value of the semiconductor industry's R&D investments—which currently outpace that of other advanced manufacturing industries—but also increases exposure to foreign control over critical technologies.

3. **Reduced Capital and FDI:** Without a national semiconductor strategy, Canada risks falling behind in the global race to attract semiconductor investment. Countries such as the U.S., South Korea, and members of the European Union, as well as countries with small semiconductor industries, including Costa Rica, Malaysia, and India, have committed billions to domestic semiconductor initiatives. These investments recognize the indispensable centrality of semiconductors in the global digital economy. Canada's lack of comparable incentives and infrastructure could deter private sector investment, stifle innovation, and result in missed opportunities for job creation and GDP growth.

4. **Opportunity Cost:** The rapid digitalization of products and services across sectors and the growing demand for AI compute capacity globally promise to boost semiconductor demand substantially, with the market expected to reach US$1 trillion (C$1.4 trillion) by 2030.[71] Other countries have recognized this growth trajectory and are beginning to invest heavily to expand their market share. Canada cannot afford to miss out on the incredible growth the semiconductor industry is expected to experience over the next decade.

5. **Supply Chain Vulnerabilities:** From agriculture and energy to automotive manufacturing and healthcare, many sectors of Canada's economy depend on embedded technologies powered by chips. Without domestic resilience, these industries are exposed to cascading effects from global supply chain shocks—such as delays in equipment delivery, reduced operational efficiency, and increased costs. A national semiconductor strategy with substantial investment in domestic fabrication and packaging infrastructure can help insulate Canada's broader economy from external disruptions by fostering local capacity, integrating with international supply chains, and improving coordination across critical sectors.

6. **Erosion of Technological Sovereignty in Emerging Technologies:** Without domestic capabilities in R&D, design, fabrication, and packaging, Canada will lose control over the critical chips that underpin its digital economy, including advanced technologies like AI and quantum. Given Canada's recent C$2 billion investment in launching its Sovereign AI Compute Strategy, failing to pay close attention to the crucial role of its domestic semiconductor industry is a major oversight that risks undermining the viability of this strategy.[72] This erosion of sovereignty could compromise Canada's ability to set standards, protect intellectual property, and ensure the integrity of critical systems.

71 Deloitte, ibid.

72 "Canadian Sovereign AI Compute Strategy," Innovation, Science, and Economic Development Canada, https://ised-isde.canada.ca/site/ised/en/canadian-sovereign-ai-compute-strategy

NATIONAL SECURITY RISKS

Without a concerted, forward-looking national semiconductor strategy, backed by public sector investments and the right policy levers, Canada risks more than losing out on the explosive growth of the semiconductor industry—it also risks losing its national and technological sovereignty.

Semiconductors play a crucial role in many military and defence applications. Telecommunication systems, encryption technologies, radar systems, sensors, cybersecurity, aerospace and other defence applications rely heavily on a range of semiconductor technologies produced by foreign suppliers. Canada's dependence on imported chips that it needs to build and maintain critical infrastructure exposes it to risks from volatile offshore suppliers.

Canada needs only to look to its southern neighbour to understand the risk to national security. The recent semiconductor trade conflict between the U.S. and China has underscored the profound national security risks associated with overreliance on foreign-controlled chip supply chains.[73] Through programs like the Microelectronics Commons (ME Commons), backed by the CHIPS and Science Act, the U.S. Department of War is investing billions to protect its semiconductor supply chains. The ME Commons will accelerate hardware prototyping, secure supply chains, and develop a skilled workforce.[74] These efforts underscore the Department's view that semiconductor resilience is not just an economic priority, but a strategic imperative for defence readiness and technological overmatch.

Given recent large-scale investments in Canada's defence industry, and its forthcoming Defence Industrial Strategy, announced in the 2025 Federal Budget, there is a window of opportunity for Canada to secure its domestic supply chain and establish a stable pipeline of dual-use semiconductor technologies needed for critical defence infrastructure.[75]

For Canada, the lesson is clear: without a robust domestic semiconductor strategy, Canada risks being caught in the crossfire of geopolitical disputes, facing supply chain disruptions, loss of technological autonomy, and diminished defensive capacity—all at a time when geopolitical tensions are on the rise. Canada must act decisively to build domestic fabrication and packaging infrastructure, secure access to domestic strategic critical minerals, and nurture trusted and reliable international alliances with likeminded nations to safeguard its security interests.

Without a coordinated national semiconductor strategy prioritizing stronger domestic production capacity and supply chain integration with reliable partners, Canada remains vulnerable to supply chain disruptions, geopolitical shocks, and foreign control over essential technologies. This dependency undermines national defence capabilities and limits Canada's ability to respond independently to global crises or cyber threats.

73 Shivakumar et al, ibid; Baskaran, ibid.

74 "Biden-Harris Administration Awards $269M for Microelectronics Manufacturing and Workforce Development; Boosting U.S. Chip-Making Capabilities," Department of War, September 17, 2024, https://www.war.gov/News/Releases/Release/Article/3908176/biden-harris-administration-awards-269m-for-microelectronics-manufacturing-and/

75 "Chapter 4: Protecting Canada's sovereignty and security," in Federal Budget 2025, Department of Finance Canada, November 4, 2025, https://budget.canada.ca/2025/report-rapport/chap4-en.html

A NATIONAL SEMICONDUCTOR STRATEGY FOR CANADA

Canada must establish a coherent, forward-looking national semiconductor strategy to protect its access to the global semiconductor value chain, create new opportunities for domestic innovation, commercialization, and growth, and attract the necessary investment to unleash its economy.

Canada has a narrow window of opportunity. Other countries, recognizing the centrality of semiconductors in the global economy, are already mobilizing to increase their share of the global market. Canada needs to move quickly or risk losing talent, IP, investment, and its position as a globally competitive country.

The strategy should define Canada's vision for the sector and articulate policies, investments, and institutional mechanisms needed to realize that vision. Given the integrated nature of the global semiconductor industry, Canada does not need to strive for semiconductor self-sufficiency. Instead, Canada should leverage its existing strengths and value proposition to carve out a distinct role in the semiconductor value chain and implement the policy levers needed to support its existing semiconductor specializations. To do so, Canada can look to the examples provided by nations such as the United Kingdom, France, and the Netherlands, described above.

The national semiconductor strategy must be backed by investment and a holistic regulatory environment to sustain and scale the industry. Building Canada's semiconductor industry should be regarded as a nation-building project with significant downstream implications on the nation's future economy as well as the success of its broader industrial strategies.

A national semiconductor strategy would complement and reconcile existing industrial strategies, such as Canada's Sovereign AI Compute Strategy, the Canadian Critical Minerals Strategy, the Pan-Canadian AI Strategy, and Canada's National Quantum Strategy.[76] Given semiconductors' position in the interstices of the technology value chain, a national semiconductor strategy is the logical next step in rebuilding and reshaping Canada's economy to be more competitive, more innovative, and more productive. By establishing a national semiconductor strategy, Canada can align its overarching industrial policies and develop a cohesive vision for the future.

To support the Government of Canada in developing its national semiconductor strategy, the Consortium has identified four pillars that can serve as a foundation for its development.

1. Establish a National Semiconductor Strategy Task Force to develop a concerted, ecosystem approach to strengthening the semiconductor industry.
2. Launch a Canadian Chips Initiative with targeted funding to build Canada's domestic semiconductor capacity, focused on specialized semiconductor applications in high-priority and strategic industries.
3. Implement and scale proven workforce solutions through the establishment of a Semiconductor Talent and Innovation Hub.
4. Establishing a Semiconductor Supply Chain Resilience Framework to proactively protect its domestic semi-conductor industry and preserve access to global supply chains.

76 See "Pan-Canadian Artificial Intelligence Strategy," Innovation, Science, and Economic Development Canada, https://ised-isde.canada.ca/site/ai-strategy/en; "Overview of Canada's National Quantum Strategy," Innovation, Science, and Economic Development Canada, https://ised-isde.canada.ca/site/national-quantum-strategy/en; "Canadian Sovereign AI Compute Strategy," Innovation, Science, and Economic Development Canada, https://ised-isde.canada.ca/site/ised/en/canadian-sovereign-ai-compute-strategy; "The Canadian Critical Minerals Strategy," Natural Resources Canada, https://www.canada.ca/en/campaign/critical-minerals-in-canada/canadian-critical-minerals-strategy.html

1 Establish a National Semiconductor Strategy Task Force to develop a concerted, ecosystem approach to strengthening the semiconductor industry.

A cornerstone of Canada's national semiconductor strategy must be the creation of a National Semiconductor Strategy Task Force, a dedicated, cross-sectoral body responsible for guiding, advising, coordinating, and implementing the country's semiconductor policy agenda. This task force would serve as a central mechanism to align federal, provincial, and territorial efforts, engage industry stakeholders, support continuity with other industrial strategies, and ensure that Canada's approach remains agile and responsive to global developments.

The task force should comprise experts from industry, academia, and civil society, including those with expertise in chip design, manufacturing, supply chain logistics, cybersecurity, and economic development. These experts will consult their networks to provide actionable insights and recommendations. Canada can look to existing industrial strategy task forces, such as its recently established AI Strategy Task Force, as a model for shaping a Semiconductor Strategy Task Force.[77]

The Task Force's mandate would include:

- **Strategic Planning:** Developing a long-term roadmap for domestic semiconductor capabilities, including R&D, fabrication, packaging, and workforce development, leveraging existing regional strengths and abilities.
- **Policy Coordination:** Harmonizing federal and provincial policies to support investment, innovation, and infrastructure development, looking to international examples and best practices to shape a robust industrial policy and coordinating with provincial strategies, such as Alberta's AI Data Centre Strategy and Ontario's Critical Minerals Strategy, to build the semiconductor value chain.[78]
- **Industry Engagement:** Facilitating partnerships and technology transfer between Canadian firms and multinational enterprises to attract private-sector investment. A key task will be to effectively communicate to domestic and global stakeholders that Canada is committed to collaborating to strengthen international semiconductor supply chains.
- **Risk Monitoring:** Assessing current and future vulnerabilities in Canada's semiconductor supply chain and advising on mitigation strategies.
- **Talent and IP Retention:** Recommending measures to cultivate and retain Canadian talent and protect intellectual property from foreign acquisition or offshoring.

By institutionalizing leadership and accountability through a national task force, Canada can move beyond fragmented industrial strategies and toward a coherent approach that aligns economic priorities and secures its position in the global semiconductor landscape.

77 "Government of Canada launches AI Strategy Task Force and public engagement on the development of the next AI strategy," Innovation, Science, and Economic Development Canada, September 26, 2025, https://www.canada.ca/en/innovation-science-economic-development/news/2025/09/government-of-canada-launches-ai-strategy-task-force-and-public-engagement-on-the-development-of-the-next-ai-strategy.html

78 "Ontario's Critical Minerals Strategy 2022–2027," Ministry of Northern Development, Mines, Natural Resources, and Forestry, https://www.ontario.ca/files/2022-03/ndmnrf-ontario-critical-minerals-strategy-2022-2027-en-2022-03-22.pdf; "Artificial Intelligence Data Centres Strategy," Ministry of Technology and Innovation, https://www.alberta.ca/artificial-intelligence-data-centres-strategy

2 Launch a Canadian Chips Initiative with targeted funding to build Canada's domestic semiconductor capacity, focused on specialized semiconductor applications in high-priority and strategic industries.

A central pillar of Canada's national semiconductor strategy should be the launch of a Canadian Chips Initiative, a targeted funding program to build domestic semiconductor capacity across key sectors of the Canadian economy. This initiative would catalyze R&D investment, design, fabrication, and packaging in specialized semiconductor applications that are critical to Canada's economic competitiveness and national security, particularly in strategic sectors such as the automotive sector, AI data centres and hyperscalers, advanced manufacturing, and clean and conventional energy.

The Canadian Chips Initiative should earmark strategic investments in domestic commercialization of the Canadian semiconductor industry, including protecting the industry's IP and establishing protocols for export controls. Furthermore, the Canadian Chips Initiative must dedicate substantial public investments in R&D, chip design, and semiconductor manufacturing infrastructure. Building Canada's semiconductor capacity can increase collaboration with partners and strengthen Canada's domestic semiconductor supply chain. The buildout of such infrastructure can also attract highly qualified semiconductor design and manufacturing professionals to capitalize on the growing global demand for specialized Canadian semiconductor outputs.

Using existing federal investment vehicles like the Strategic Innovation Fund (SIF) to invest in semiconductor R&D in specialized subfields can generate substantial returns. According to the SIF's impact report, every dollar of SIF funding generates almost C$9 in private investment.[79] Catalyzing growth and private sector investment through a Canadian Chips Initiative is thus a strategic opportunity to not only build Canada's semiconductor ecosystem, but generate long-term and sustainable economic diversification and resilience across the economy.

Furthermore, existing federal departments, such as the National Research Council (NRC), are well-positioned to play a leading role advancing Canada's semiconductor industry. NRC currently operates the Canadian Photonics Fabrication Centre (CPFC)—one of the few facilities in North America capable of prototyping and manufacturing photonic devices. NRC's strategic role in Canada's domestic industry already positions it as a critical enabler for companies and researchers working in advanced semiconductor technologies. With strategic investment and policy alignment, the NRC could expand its role to become a national hub for semiconductor R&D, talent development, and commercialization, helping to bridge the gap between academic research and industrial application.

79 "Impact report: Strategic Innovation Fund," Innovation, Science, and Economic Development Canada, 2024, https://ised-isde.canada.ca/site/ised/sites/default/files/documents/impact-report-en.pdf

The Canadian Chips Initiative should focus on:

Automotive Sector: Canada's automotive sector is one of the country's most valuable industrial engines. In 2024, the automotive sector contributed C$16.5 billion to Canada's GDP and employed over 600,000 Canadians.[80] It is also one of the sectors most dependent on highly complex semiconductor components to power the advanced technologies that define modern vehicles. From engine control units and infotainment systems to electric drivetrains and autonomous driving capabilities, semiconductors are essential for vehicle performance, safety, and connectivity. Furthermore, electric vehicles require two to three times the number of chips as conventional vehicles, making chips a critical factor in Canada's ambition to achieve 100% zero-emission vehicle sales by 2035.[81]

According to CSC, Canada produces minimal semiconductor content for automotive applications, with only a handful of automotive-focused semiconductor firms in Ontario and Quebec.[82] The industry is heavily reliant on foreign suppliers for semiconductor components, thereby increasing its vulnerability to supply chain disruptions. This dependence compounds existing threats to the stability of the automotive sector's operations, including the recent imposition of tariffs by Canada's largest trading partner.

The growing electrification and digitalization of Canada's automotive sector is significantly increasing demand for semiconductor components, which are essential to the functionality and performance of electric vehicles (EVs). A typical EV now contains over 1,500 semiconductor components, with semiconductors accounting for up to $2,000 CAD of an EV's bill of materials.[83] As a result, the global automotive semiconductor market is projected to increase to US$200 billion by 2040—more than quadruple the global market in 2019, underscoring the urgency for Canada to strengthen its domestic semiconductor supply chain to support its automotive transformation and mitigate economic and national security risks.[84]

To protect its automotive sector, Canada must ensure a boost in domestic innovation and capacity in automotive semiconductor chips through targeted investments. This will not only enable Canada's automotive sector to reduce its vulnerabilities but also augment its automotive sector exports and diversify trading partners.

AIoT, Data Centres and Hyperscalers: The acceleration of AI across sectors has substantially increased demand for semiconductors. AIoT (Artificial Intelligence of Things) relies on semiconductors as the foundational hardware that powers sensors, processors, and connectivity modules, enabling intelligent data processing and real-time decision-making at the edge. AI data centres and hyperscalers are dependent on advanced semiconductors to power high-performance computing, generative AI, and large-scale data processing. These facilities rely heavily on specialized chips such as graphics processing units (GPUs), AI-specific application-specific integrated circuits (ASICs), and AI-capable CPUs, which are essential for training and inference in machine learning models.

Canada possesses deep expertise in specialized segments of the semiconductor industry—particularly in optical computing, MEMS, and integrated photonics—which positions the country to play a strategic role in enabling AIoT and edge AI and addressing the escalating energy demands of AI data centres and hyperscale computing environments. Optical computing and integrated photonics offer transformative solutions by enabling faster data transmission and processing with significantly lower power consumption compared to traditional electronic systems. Canadian institutions and companies are at the forefront of developing photonic integrated circuits (PICs), silicon photonics, and quantum photonics technologies, which can reduce latency and heat generation in data centres. Leveraging these capabilities not only aligns with global sustainability goals but also presents a unique opportunity for Canada to carve out a niche in the next generation of semiconductor innovation.

In 2024, the global semiconductor market for data centres reached $209 billion, with projections to

80 "Canada's auto industry drives the economy," Canadian Vehicle Manufacturer's Association, https://www.cvma.ca/industry/importance/

81 Luke Gear, "EV Power Electronics: Driving Semiconductor Demand in a Chip Shortage," IDTechEx, September 23, 2021, https://www.idtechex.com/en/research-article/ev-power-electronics-driving-semiconductor-demand-in-a-chip-shortage/24820; "Canada's Zero-Emission vehicle sales targets," Transport Canada, https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles/canada-s-zero-emission-vehicle-sales-targets

82 Ouellette, ibid.

83 Ouellette, ibid.

84 Scott Jones, Gary Silberg, Irene Signorino, and Bala Lakshman, "Automotive semiconductors: The new ICE age," KPMG, 2021, https://assets.kpmg.com/content/dam/kpmgsites/es/pdf/2021/03/automotive-semiconductors-2021.pdf.coredownload.inline.pdf

exceed $492 billion by 2030, driven largely by hyperscaler demand and AI workloads.[85] Most of these semiconductors are sourced from foreign suppliers, with companies like NVIDIA, AMD, and Intel dominating the market.[86]

This reliance on external sources exposes critical Canadian AI and digital infrastructure to geopolitical and supply chain risks. Without a cohesive national semiconductor strategy, Canada's current AI industrial policies are at risk of missing their targets, underscoring the need for domestic capacity to support sovereign AI development and secure cloud infrastructure.

Advanced Manufacturing: Canada's advanced manufacturing sector relies heavily on semiconductors to enable smart technologies and real-time data processing. These applications use a range of chips, including microcontrollers, system-on-chip (SoC) solutions, analog chips, and AI-optimized processors for predictive maintenance, machine vision, and intelligent control systems.

Despite Canada's strengths in semiconductor design and R&D, the country lacks large-scale fabrication capacity and remains dependent on imports from global leaders such as Taiwan, South Korea, and the United States, with Taiwan alone producing over 60% of the world's semiconductors and more than 90% of the most advanced chips.[87]

To preserve its advanced manufacturing sector, Canada must ensure it builds a domestic semiconductor industry that can leverage its strengths in specialized chip design to secure its position in the global semiconductor marketplace.

Clean Tech and Clean Energy: Canada's ambitious Net-Zero Emissions Accountability Act enshrines Canada's commitment to achieve net-zero emissions by 2050. To achieve this goal, Canada must urgently invest in clean technology and renewable energy sources to reduce its emissions and preserve its environment for generations to come.

Canada's clean tech and clean energy sector relies heavily on semiconductors to enable key functions, including energy generation, conversion, storage, and intelligent control. Semiconductors are essential for converting DC to AC power, managing energy flow, and ensuring system efficiency across renewable infrastructure.

Canada's Clean Electricity Strategy is a core pillar in its overarching economic revitalization strategy. The Strategy outlines a roadmap to shift to a low-carbon economy, which is expected to create 60,000 jobs in the electricity sector alone from 2030 to 2050.[88] However, realizing these low-carbon ambitions requires establishing a resilient domestic semiconductor supply chain capable of providing the chips needed to support clean electricity investments.

85 "Data center semiconductor trends 2025: Artificial Intelligence reshapes compute and memory markets," Yole Group, August 12, 2025, https://www.yolegroup.com/press-release/data-center-semiconductor-trends-2025-artificial-intelligence-reshapes-compute-and-memory-markets/

86 Yole Group, ibid.

87 Hui, ibid.

88 "Powering Canada's Future: A Clean Electricity Strategy," Natural Resources Canada, https://natural-resources.canada.ca/energy-sources/powering-canada-s-future-clean-electricity-strategy

3 Implement and scale proven workforce solutions through the establishment of a Semiconductor Talent and Innovation Hub.

Canada has all the necessary ingredients to become a leader in specialized semiconductor devices, including world-class research facilities, top-ranked academic institutions, and a talented and dynamic workforce. To synthesize these strengths, Canada must scale proven workforce development solutions by forming Semiconductor Talent and Innovation Hubs that bring together academia, industry, workforce development providers, and industry associations to cultivate diverse talent pipelines capable of transforming the semiconductor industry.

Canada's semiconductor industry is highly concentrated in Ontario, Quebec, Alberta, and British Columbia. Ecosystem clusters can be found in Ottawa, the Greater Toronto Area, Bromont and Sherbrooke, Edmonton, and Vancouver, each with strengths in specific technologies and applications. For example, Ottawa is a hub for compound semiconductors and photonics, while Toronto's semiconductor ecosystem specializes in analog, mixed-signal, and photonics. Bromont is home to facilities specializing in MEMS development and production, while Edmonton has strengths in nanofabrication, silicon nanomaterials, and MEMS. In quantum semiconductor technologies, both the GTA and Bromont and Sherbrooke are leading clusters. Meanwhile, Vancouver is home to firms that specialize in advanced network technologies and chip design.[89]

Given these regional specializations, Canada should leverage its existing infrastructure and capabilities by establishing regional Semiconductor Talent and Innovation Hubs to cultivate the digital and technical skills needed to scale these specialized semiconductor sectors. Adopting a partnership and ecosystem-based approach can address the industry's severe talent and skills gaps while giving semiconductor firms—especially SMEs that struggle to compete for STEM talent—direct access to regional talent pools. Furthermore, a hub approach to talent development can generate critical mass in specialized semiconductor devices and serve as a talent attraction and recruitment vehicle to bring highly qualified professionals and private investment to Canada.

Furthermore, a hub approach to semiconductor talent and innovation can significantly accelerate Canada's capacity to generate intellectual property, foster entrepreneurship, and drive regional economic growth. By concentrating resources, expertise, and infrastructure in regionally tailored hubs, Canada can create fertile environments for collaboration between academia, industry, and startups. These hubs can serve as incubators for new firms, enabling rapid prototyping, commercialization of research, and the development of proprietary technologies. With targeted support for IP protection and technology transfer, hubs can help Canadian innovators retain ownership of their breakthroughs, reduce reliance on foreign patents, and position Canada as a global leader in specialized semiconductor applications.

89 Henningsmoen et al, ibid.

4 Establishing a Semiconductor Supply Chain Resilience Framework to proactively protect Canada's domestic semiconductor industry and preserve access to global supply chains.

Canada must leverage its unique semiconductor capabilities to establish stable and secure supply chain pipelines for its most critical sectors, which rely extensively on complex semiconductor components.

Canada must leverage its unique semiconductor capabilities to establish stable and secure supply chain pipelines for its most critical sectors, which rely extensively on complex semiconductor components.

To safeguard Canada's economic, technological, and national security interests, a national semiconductor strategy must include the creation of a Semiconductor Supply Chain Resilience Framework. This framework would identify vulnerabilities, diversify sourcing, and strengthen domestic capabilities across the semiconductor value chain—from raw materials and design to fabrication, packaging, and distribution. This framework would also identify international allies with shared priorities, values, and complementary industries and resources.

Recent global events, including the COVID-19 pandemic, shifting political relationships, and trade disruptions, have exposed the fragility of highly concentrated semiconductor supply chains. Canada, like many nations, relies heavily on imports from a select few countries, several of whom are at risk of ongoing geopolitical tensions. This dependence leaves Canadian industries vulnerable to external shocks, price volatility, and strategic coercion.

Canada's Semiconductor Supply Chain Resilience Framework should include:

- **Risk Mapping and Monitoring:** A national assessment of supply chain dependencies, chokepoints, and geopolitical risks.
- **Strategic Partnerships:** Bilateral and multilateral agreements to secure access to critical inputs and technologies.
- **Domestic Capacity Building:** Incentives for local fabrication, packaging, and testing facilities to reduce reliance on foreign sources.
- **Emergency Preparedness:** Protocols for rapid response to supply disruptions, including strategic reserves and alternative sourcing pathways.

By establishing this framework, Canada can protect its semiconductor-dependent industries, ensure continuity in critical infrastructure, and enhance its strategic autonomy. A resilient semiconductor supply chain will not only support economic growth and innovation but also fortify Canada's defense, cybersecurity, and energy systems against future disruptions.

FORTHCOMING RESEARCH:

TOWARDS CANADA'S NATIONAL SEMICONDUCTOR INDUSTRY STRATEGY: AN ECONOMIC IMPACT ANALYSIS

There are important gaps in up-to-date, systematic knowledge of Canada's semiconductor industry. Knowledge gaps are particularly acute regarding key characteristics of the industry structure, including the degree of foreign ownership, the participation and impact of multinational enterprises in the sector, and the ownership structure (i.e., private versus public ownership) of Canadian semiconductor firms.

Likewise, the current economic impacts of Canada's semiconductor industry are not fully established. This includes key economic data on the semiconductor industry's GDP contribution, segmented by major sub-activities, such as R&D and design, EDA software development, manufacturing, and chip packaging.

Furthermore, the origins and levels of FDI, and the role FDI plays in Canada's domestic industry, represent another significant gap in economic knowledge of the semiconductor industry in Canada. Moreover, sensitivity to trade disruptions in key export markets, such as the United States, and Canadian semiconductor producers' contingency plans to overcome trade shocks are important but under-explored topics critical to the semiconductor sector and the stability, resilience, and security of Canada's digital economy at large.

From a taxation perspective, the Canadian semiconductor industry's estimated net contribution to public revenues through various tax payments, as well as important deductions under programs such as SR&ED, is not publicly available. Calculating these revenues and their potential growth, induced by the recommended development of a national semiconductor strategy, will be key to understanding the critical role of the semiconductor industry within Canada's advanced manufacturing and technology sector.

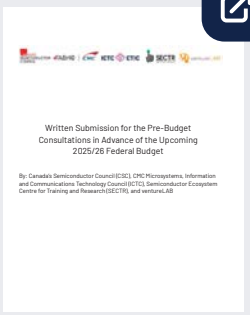
From an industrial policy perspective, Canada lacks a benchmark and comparative policy analysis of current and historical industrial strategies pursued by peer economies to establish and foster their semiconductor sectors—including a critical assessment of which policies proved effective and which failed. As Canadian policymakers ponder the future of Canada's semiconductor sector, in the face of geopolitical and geoeconomic disruption, rapid technological advancements, and a renewed interest within the Canadian policy community in pursuing industrial policy to support major capital projects in strategic economic sectors.

Finally, an up-to-date economic forecast of sectoral growth, based on current sector performance and likely future policy and market scenarios, is also greatly needed to improve understanding of the Canadian semiconductor industry.

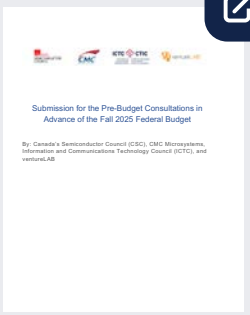
To address these critical knowledge gaps, ICTC, in collaboration with a consortium of semiconductor industry associations and industry partners, will conduct an economic impact analysis of the Canadian semiconductor industry. This report, scheduled for release in early 2026, will establish a comprehensive baseline analysis and model various forecast scenarios based on government and private-sector investments. The report will serve as a benchmark for Canada to track its progress towards developing a robust and resilient semiconductor industry.

ABOUT THE SEMICONDUCTOR CONSORTIUM

This policy brief was written and prepared for a consortium of semiconductor and technology industry associations. Previous collaborations between the Consortium include:



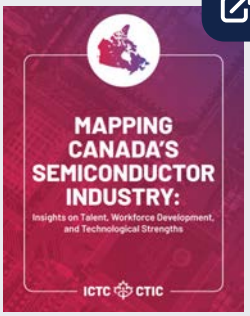
Joint submission to the Department of Finance's Federal Budget Consultation in March 2025



Joint submission to the Department of Finance's Federal Budget Consultation and the House of Commons Standing Committee on Finance in August 2025



Strengthening Canada's Semiconductor Talent Pipeline for Global Competitiveness, a 2025 report published by Canada's Semiconductor Council



Mapping Canada's Semiconductor Industry: Insights on Talent, Workforce Development, and Technological Strengths, published in November 2025 by the Information and Communications Technology Council

Consortium partners include:

Canada's Semiconductor Council: Canada's Semiconductor Council (CSC) is a national semiconductor industry organization representing a broad ecosystem of companies and institutions involved in the development and manufacturing of semiconductor components. CSC is dedicated to accelerating the growth and development of Canada's semiconductor sector. The organization's goal is to strengthen our domestic supply chain resiliency and future in the digital economy by establishing Canada as a leader for semiconductor research, design and development, and manufacturing at the forefront of commercialization and innovation for the global semiconductor industry.

CMC Microsystems: CMC Microsystems (CMC) is a national, not-for-profit organization that drives innovation within the semiconductor ecosystem. For over 40 years, CMC has been supporting advanced research and technology development through cutting-edge design, manufacturing, and testing. Supporting over 1,200 companies and 12,000 academic participants, CMC provides technical support and hands-on training to strengthen Canada's semiconductor pipeline. With funding from the Government of Canada's Strategic Innovation Fund (SIF), CMC has launched the FABrIC program to stimulate Canada's semiconductor industry. FABrIC funding will be used to develop novel semiconductor processes and products in MEMS, photonics, and quantum technologies, and to support fabrication facilities in Canada and to provide access to academics and start-up companies. FABrIC provides funding for prototyping and product development of Internet of Things (IoT) products for various market segments.

Information and Communications Technology Council: The Information and Communications Technology Council (ICTC) is a national, neutral, not-for-profit centre of expertise whose mission is to strengthen Canada's digital advantage in the global economy. For more than 30 years, we have provided forward-looking research, practical policy advice, and innovative, industry-informed capacity development solutions for individuals, businesses and the public sector. Comprised of a national team of experts from coast to coast, our goal is to ensure that technology is used to drive economic growth and innovation, and that Canada's workforce remains globally competitive.

ventureLAB: ventureLAB is a leading global founder community for hardware technology and enterprise software companies in Canada. Located at the heart of Ontario's innovation corridor in York Region, ventureLAB is part of one of the biggest and most diverse tech communities in Canada. Our initiatives focused on raising capital, talent retention, commercializing technology and IP, and customer acquisition have enabled thousands of companies to create over 7,300 jobs and raise more than $420 million in investment capital. At ventureLAB, we power hardtech founders to build and scale globally competitive ventures that advance Canada's knowledge-based economy.