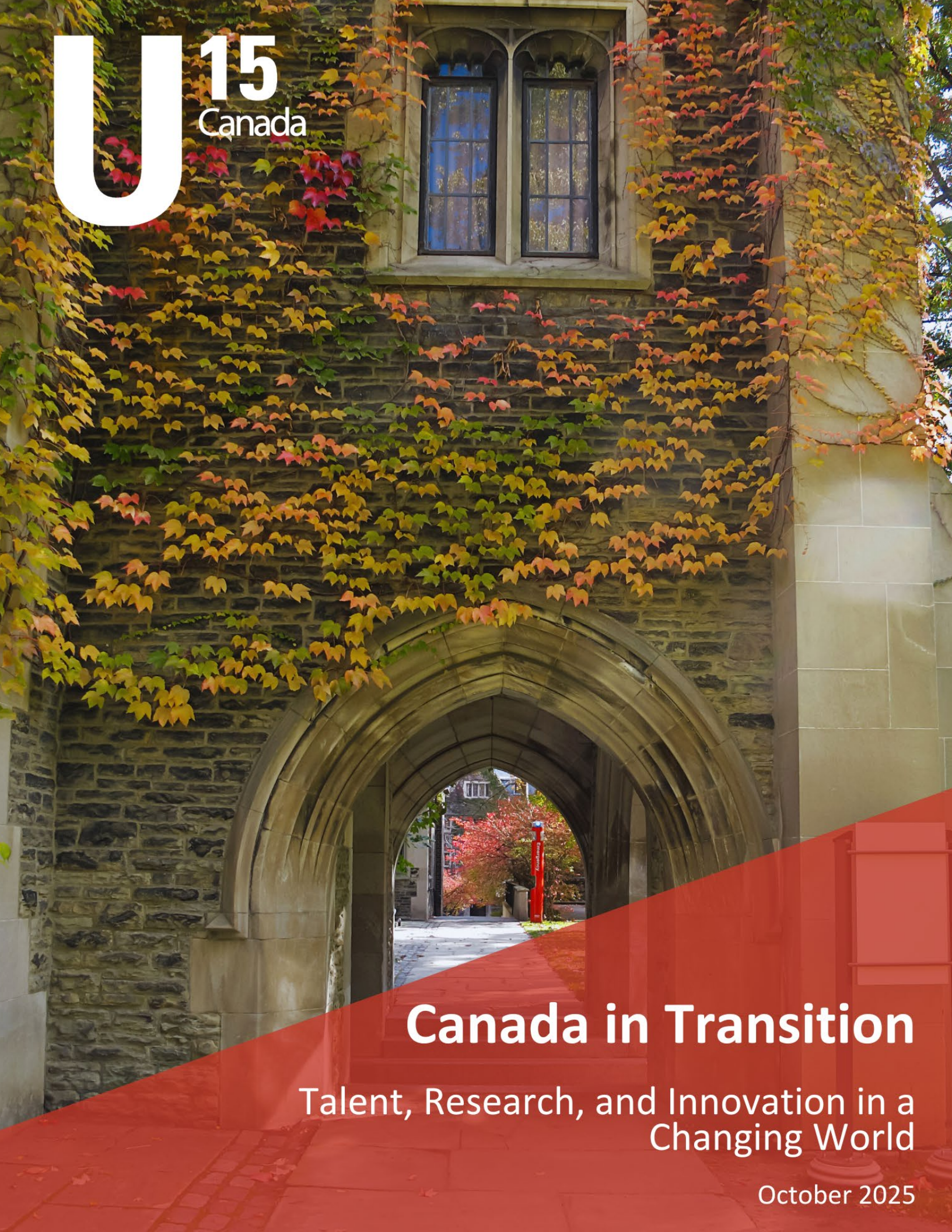
U15 Canada



Canada in Transition

Talent, Research, and Innovation in a Changing World

October 2025

Introduction

Canada faces an uncertain future. A shift in our trading relationships, alongside weak productivity growth and fiscal constraints, is converging into a profound test of Canada's security and resilience. The choice before us is clear, and the new government has clearly articulated the need to respond. Canada cannot just continue to mitigate external shocks with limited control. We must seize this moment to invest in the foundations of long-term economic sovereignty, including talent, research, and innovation-driven industrial capacity. The twin pillars of economic and national security now stand as the foremost imperatives.

At a time when the federal government is reviewing fiscal commitments, investments in research and innovation must be seen as a long-term driver of productivity, prosperity, and resilience. The new government's mandate letter commits to spending less on operations so that it can invest in people and businesses to build the strongest economy in the G7; talent, research, and innovation are central to this new mission.

Canada's leading research universities have set out a roadmap for success to meet this moment and achieve a Canada that is strong, secure and resilient. As the federal government develops a critical budget to respond to these imperatives, U15 Canada has expanded on these proposals with a set of recommendations where the government should act with urgency and ambition:

- **Rebuild Canada's talent advantage** by exempting graduate enrolments from international student caps and creating a distinctions-based immigration system to attract and retain the world's best talent.
- **Strengthen Canada's research backbone** through a Sovereign Technologies Fund that deploys public R&D in mission-driven areas such as AI, clean energy, critical minerals, and biomanufacturing.
- **Build a science and innovation architecture for scale and impact** by establishing the institutions and feedback loops needed to better connect research to strategic and industrial priorities, starting with the Defence Industrial Strategy.

Innovation is the foundation of a strong, competitive economy. The urgency to remain at the forefront has never been greater as trade disruptions, digital and AI transformation, and rising geopolitical tensions continue to reshape industries and disrupt global supply chains.

Not only do universities play a central role in advancing innovation and supporting Canada's economic and national security priorities, but their mission remains far-reaching. They educate the next generation of leaders and citizens, foster discovery across all disciplines, and contribute to Canada's health, climate, culture, and social well-being. This breadth of contribution ensures that, even as Canada focuses on the urgent imperatives of sovereignty and competitiveness, universities continue to strengthen the full fabric of Canadian society.

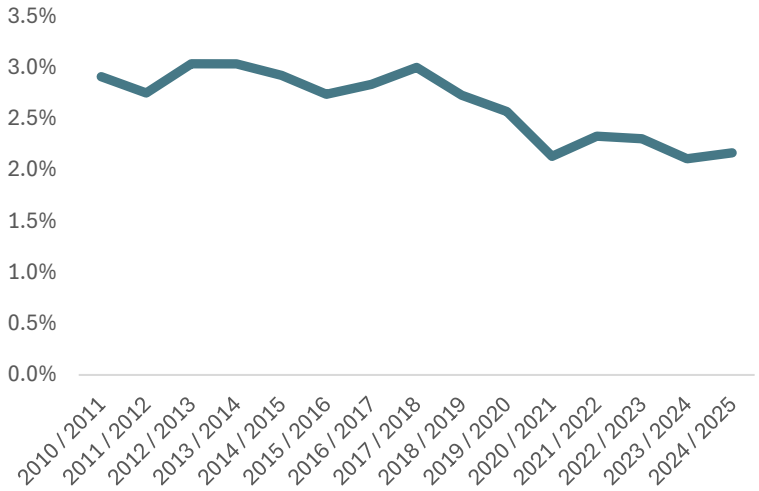
Revitalizing Canada's Innovation Engine

Canada's innovation system is under strain at a time when we can least afford it. A slowing economy, rising unemployment, and decades of eroding competitiveness underscore our need to recognize that economic resilience and national security increasingly hinge on our country's capacity to innovate.

Across advanced economies, sustained investment in R&D has consistently powered technological progress, intangible capital formation, and productivity gains. Public R&D, in particular, plays a catalytic role, building the science base that enables firms to generate new patents, technologies, and high-value products. Evidence shows that even modest increases in public R&D yield outsized returns, lifting private-sector productivity more effectively than private R&D alone and contributing significantly to long-term growth. Public research investments also generate broad societal returns, including saving lives. For example, in the U.S., sustained NIH investment—much of it through universities—has helped save 3.8 million cancer-related lives since 1991, cut heart attack deaths by 56%, and driven nearly 500 Alzheimer's clinical trials.

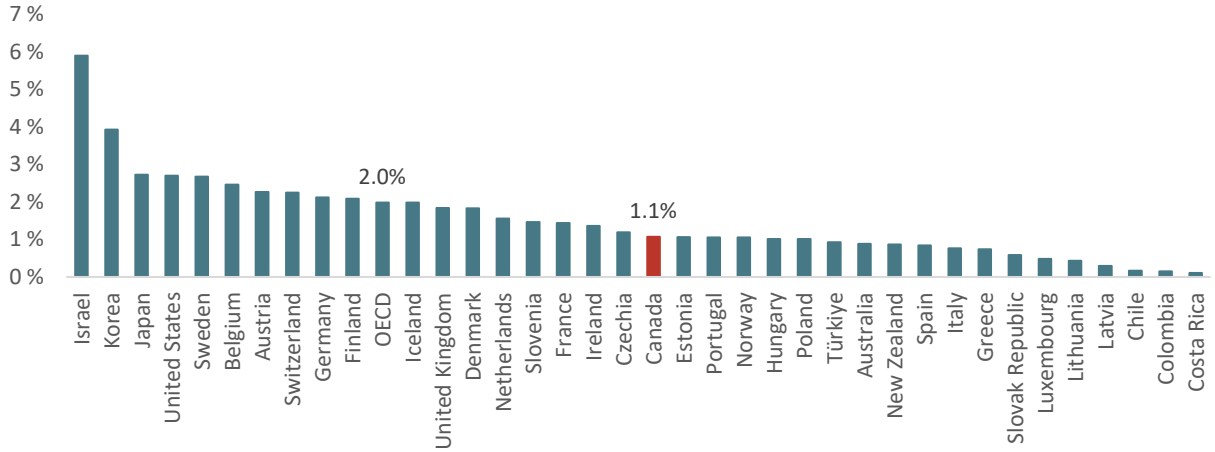
Canada, however, has been investing at comparatively lower levels for decades. In 2023, total R&D spending in Canada amounted to just 1.81% of GDP, well below the OECD average of 2.7%. Government intramural R&D amounts to just 0.11% of GDP—less than half the OECD average of 0.23%—and total federal R&D investments as a share of Main Estimates has fallen from 3% in 2010 to under 2.2% in 2024. Moreover, Canada leans more heavily on higher education, which contributes 34.4% of total R&D—more than double the OECD average of 16%—the majority of which is self-financed. We need to treat R&D as an investment, not an expenditure, and more deliberately connect business innovation to the capacity already built within the research enterprise.

Figure 1: Government R&D Expenditures as a Share of Main Estimates (Intramural & Extramural)



Meanwhile, business R&D intensity lags at just 1.1% of GDP, placing Canada second-to-last in the G7 and far behind leaders like Japan, the United States, and Germany. Federal supports are significant—programs such as Business Innovation and Growth Support (BIGS) delivered $5.9 billion to 39,000 firms across 172 programs in 2022, while SR&ED provided $4.2 billion in tax credits to 21,500 claimants in 2023–24—but the system is fragmented. It could be better aligned with a broader industrial strategy. The missing pieces are a strategy for Canada's economy and an architecture that marshals our collective strengths toward achieving greater industrial capability.

Figure 2: Business Expenditures on R&D as a % of GDP (2023 or Latest)

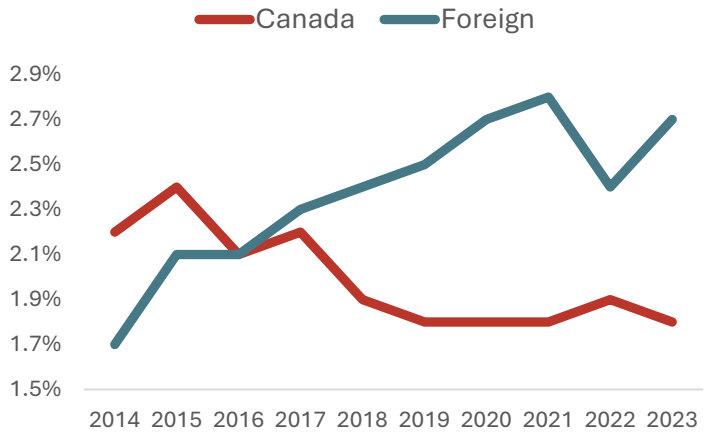


Despite sustained support, the number of firms conducting in-house R&D has declined, falling 4% between 2014 and 2022 (from 18,941 to 18,275), with sharp drops in traditional industries: -29% in manufacturing, -30% in agriculture, and -41% in mining, oil and gas. At the same time, activity has become increasingly concentrated. Businesses with fewer than 20 employees make up 86% of all firms but account for only 10% of in-house R&D, while just 0.4% of firms (those with 500+ employees) undertake half.

Moreover, foreign-controlled companies now perform 37% of business R&D in Canada, investing nearly nine times more per firm than Canadian companies. Their R&D intensity has risen to 2.7% of revenues, while Canadian firms have slipped to 1.8%—highlighting both Canada's reliance on foreign investment and the need to strengthen domestic innovation capacity.

Here, Canada's leading research universities already provide a strong foundation to build upon. In 2022/23 alone, U15 Canada universities conducted $866 million in industry-sponsored R&D—76% of all higher education–industry partnerships nationwide. Federal support has been critical in enabling thousands of collaborations, and the challenge now is to mobilize this capacity at scale, deepening ties between academia and Canadian enterprises—particularly SMEs—to expand domestic R&D activity and strengthen national competitiveness.

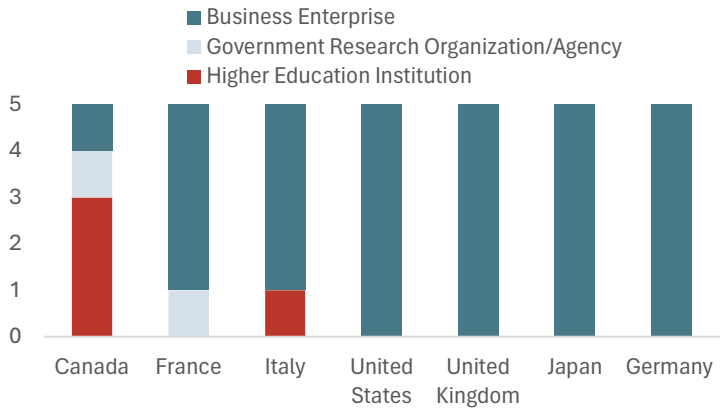
Figure 3: In-House R&D Expenditures as a % of Revenues, Canadian Versus Foreign-Controlled



Without catalyzing and scaling stronger relationships such as these, Canada risks continuing a troubling pattern where it generates fewer innovation outputs relative to its inputs. Patent activity illustrates the issue. Since 2010, resident patent applications per million inhabitants have fallen by nearly 25%, while Canada's international performance has also slipped—ranking 13th

globally and last in the G7 for Patent Cooperation Treaty filings, with a 10% decline since 2010. And unlike G7 peers, where corporations dominate applicants, three U15 Canada universities and affiliated hospitals were in the top five PCT filers from 2021-2023—underscoring the need to better translate academic strengths into business innovation through stronger university–industry linkages.

Figure 4: Top Five PCT Applicants by Type (2021-2023)



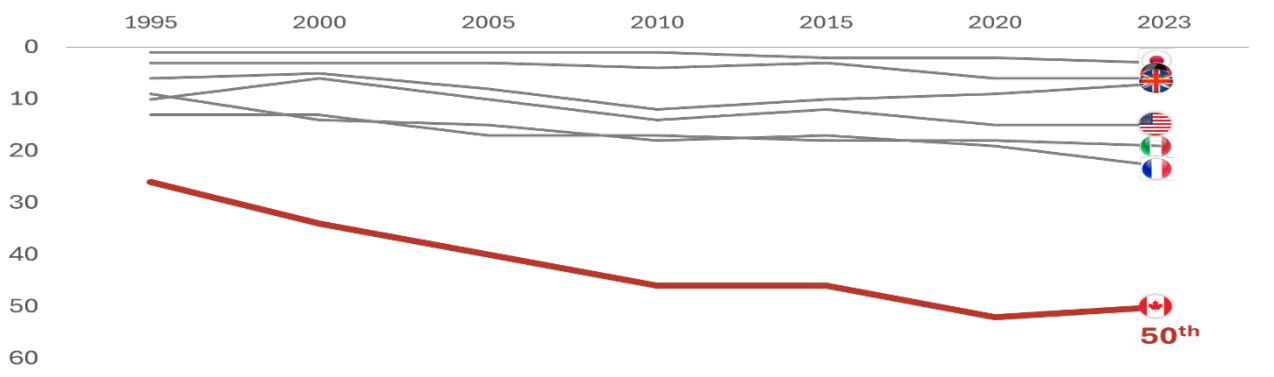
Ultimately, this translation gap is visible in Canada's trade profile. The number of exporting firms has stagnated since 2000, and in 2024, about three-quarters of Canadian exporters sold to a single market, and only 5% reached more than ten markets, leaving Canada highly dependent on the U.S. amid rising trade tensions and uncertainty.

At the same time, only 17% of Canada's manufacturing exports are considered high-tech, compared with 29% in the U.K. and 24% in the U.S. This narrow market and product base contributes to the country's low Economic Complexity Index ranking, reflecting an economy still concentrated in less complex goods. Innovation must be harnessed as a driver of export diversification—broadening markets, expanding the range of high-value products, and positioning Canadian firms to compete at scale.

Canada must put innovation at the centre of its growth agenda by designing policies and mechanisms that mobilize public R&D, leverage the research enterprise, and catalyze stronger private investment—particularly among Canadian firms. The work of Canada's leading research universities underpins this agenda. By developing talent, driving innovation, and delivering impact, this research is improving health, tackling climate change, and informing public policy. Through discoveries and partnerships, they fuel productivity and regional growth while anchoring clusters in areas such as life sciences, quantum, and agriculture—translating knowledge into tangible benefits for Canadians and industry alike.

With focus and determination, Canada can build the foundations of a more competitive and resilient economy, where research is not only a source of discovery but a pillar of national security and long-term economic strength.

Figure 5: Economic Complexity Index Rankings (G7 Countries)



A Window of Opportunity

While Canada's innovation challenges are deep-rooted, the current moment offers a rare opportunity to take a more deliberate approach. Budget 2025 provides the policy space to rethink how Canada prioritizes and supports innovation and how those efforts connect to the necessity of economic and national security. With fiscal pressures driving government to spend more strategically, talent, research, and innovation should be placed at the heart of that strategy.

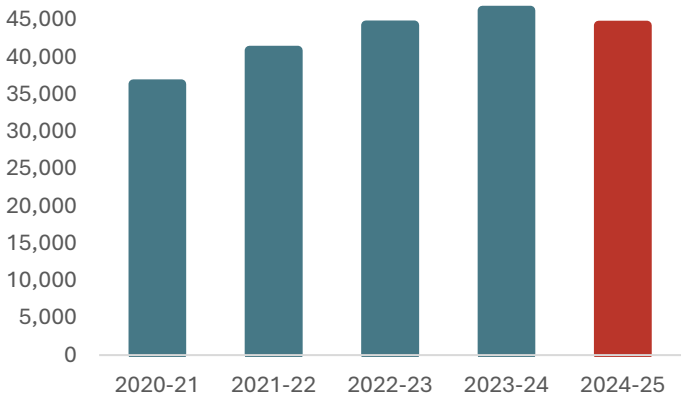
Canada's leading research universities are central to this strategy—developing highly qualified talent, advancing frontier research, and supporting technology development and industrial innovation. With Canada's share of global R&D down to 1.1% in 2023 from 2.2% in 2000, global connections remain essential. Canada's leading research universities play a crucial bridging role—locally rooted and internationally engaged—linking Canada to international research networks and amplifying domestic strengths through initiatives like Horizon Europe. These purpose-built global hubs of excellence shaped by U15 universities, explored in U15 Canada's recent policy papers, *Developing Talent: How We Close the Talent Gap*, *Driving Innovation: The Path to Homegrown Prosperity*, and From Discovery to Prosperity: A Roadmap for Homegrown Success, should be leveraged further to bridge the gap between research and industrial capacity.

Canada's ability to compete and thrive will depend on the talent we develop, the research and innovations we generate, and the governance architecture and strategic vision that enable us to deploy them effectively. It is not enough to cultivate people and ideas; we must also ensure they are mobilized at scale, connected to industry, and aligned with national priorities.

1. Talent: The Cornerstone of Nation-Building

Talent is one of Canada's greatest competitive assets. In an era of demographic pressures and intensifying global competition for expertise, the countries that thrive will be those that develop, attract, and retain the best and brightest talent. Canada's leading research universities give us a head start in that race, enrolling nearly 50% of all university students—close to 700,000 people—and graduating more than 156,000 students annually, including 48,000 graduate students. They are also magnets for top international talent, drawing highly skilled students and researchers from around the world. We must strengthen this advantage, not erode it.

Figure 6: U15 Canada International Graduate Enrolments



However, while Canada remains a destination of choice for highly skilled international students and researchers, recent reforms—including study permit caps, administrative hurdles, and processing delays—are putting this advantage at risk. Interest is falling sharply, with only 13% of international students now ranking Canada as their top choice, down from 27% in 2023. Even leading research universities have seen international enrolments fall, including a 19% drop in first-year international bachelor's students at U15 Canada universities—eroding the entry point for the best and brightest talent to come to Canada.

To reverse course, Canada should exempt graduate enrolments from study permit caps, recognizing their importance and role in building greater domestic innovation capacity. We must now rebuild an international student system through a distinctions-based approach that recognizes excellence, incentivizes the best talent to come to top institutions, and restores Canada's reputation as a preferred destination for the world's best talent.

2. Research: The Backbone of Economic and National Security

No modern industrial strategy can succeed without research at its foundation. Before innovation can be developed by industry, government, or civil society, it begins in a lab or research program. Canada cannot hope to build globally competitive industries without sustained investment in discovery science and applied research.

Luckily, Canada has a strong base to build on. U15 Canada universities are engines of discovery and world-leading science, producing tens of thousands of publications, filing over 18,000 invention disclosures, 11,000 patent applications, and launching more than 1,100 research-based startups since 2010—including nearly 120 in 2023 alone. This capacity fuels new ideas, technologies, companies, and expertise that secure made-in-Canada solutions. By leveraging the full breadth of the research ecosystem across all disciplines, Canada can better drive technological breakthroughs and ensure research provides solutions to industrial, environmental, and social needs.

However, Canada continues to be outpaced in advancing critical technologies that underpin sovereignty and resilience. The Australian Strategic Policy Institute ranks Canada in the top five for high-impact research in only 3 of 64 critical technology areas—such as defence, AI, and quantum. Similarly, Harvard's Belfer Center places Canada 12th overall in its Critical and Emerging Technologies Index that assesses national power, with mixed results across key sectors: 6th in quantum, 8th in AI, 9th in biotech, and 16th in both semiconductors and space.

We can no longer afford to solely rely on technologies developed elsewhere. Canada must act now to expand its domestic capacity. A **Sovereign Technologies Fund** could provide the vehicle to focus and deploy Canada's research and innovation capacity towards mission-driven areas tied directly to economic and intellectual sovereignty. Success will depend on drawing from interdisciplinary expertise to ensure that technological advances are adopted effectively, aligned with policy, and connected to societal needs. Early focus areas could include:

- AI and Digital Transformation: foundational and applied AI, quantum computing, data infrastructure, and cybersecurity.
- Energy and Resource Security: cleantech, energy storage, critical minerals, and food security.
- Biotech and Health Innovation: biomanufacturing, genomics, vaccine platforms, and life sciences infrastructure.

Such a fund should leverage Canada's academic research base and deepen R&D partnerships with Canadian enterprises, particularly among SMEs, to strengthen the links between public research and private-sector innovation. Aligning research, talent, and commercialization would create pathways from discovery to deployment while catalyzing private investment, intellectual property generation, and technology adoption.

3. The Innovation Architecture: Building the Institutions of Translation and Scale

To leverage talent and research more effectively, Canada must also build the institutional plumbing—the incentives, intermediaries, and translational platforms that move ideas from discovery to deployment. A modern science, technology, and innovation support system that is purpose-built for speed, scale, interdisciplinary collaboration, and sovereignty is essential.

This is not a new insight. Both the Fundamental Science Review and the Bouchard Report underscored the need for coherent governance, stronger coordination, and deliberate mechanisms to leverage Canada's research capacity towards achieving industrial and societal priorities. Successful industrial policy depends not only on ambition but also on a strategic vision and a robust governance architecture: strategies must be clear, institutions must align around shared priorities, and evaluation must provide transparency and accountability.

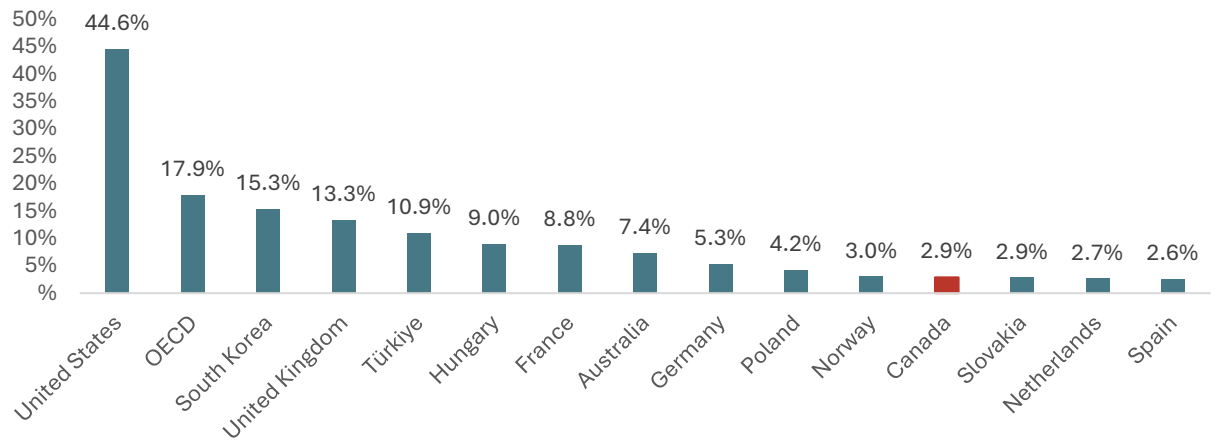
The groundwork is beginning to take shape. Initiatives such as the Council on Science and Innovation (CSI), the proposed capstone research organization, BOREALIS, and the new Defence Industrial Strategy reflect a growing recognition that Canada needs more than incremental program fixes. To be impactful, these efforts must build on the existing research support ecosystem—granting councils, CFI, and third-party research organizations—while creating feedback loops that align public investments with industrial priorities, support scale-up efforts, and foster deeper university–industry collaboration.

The Defence Industrial Strategy presents the first opportunity to refine this architecture and put it into practice towards better aligning Canada's research ecosystem with national security objectives. That opportunity can already be seen across Canada's leading research universities, such as at the Centre for Applied Research in Defence and Dual-Use Technologies (CARDD-Tech) at the University of Alberta. Launched in 2025, it has mobilized over $25 million in research projects across themes such as advanced materials, quantum, AI, space, and autonomous systems, working with more than 30 defence industry partners and engaging faculty, students, and SMEs to strengthen supply chains and deliver innovations for Canada's defence and economic security.

Other countries already integrate and connect higher education research to defence priorities, investing heavily in defence R&D to build partnerships, strengthen sovereignty, spur private-sector innovation, and boost productivity. This must also become a clear priority for Canada, where defence policy treats innovation as a central pillar and leverages the research enterprise to achieve security goals while driving wider economic benefits.

Currently, only 2.9% of Canada's federal R&D budget goes to defence—far below the OECD average of 17.9% and the U.S. share of 44.6%. Evidence shows these investments have spillover benefits, where a 10% rise in government-financed defence R&D is linked to a 5–6% increase in private-sector R&D, while a one-point increase in the defence R&D-to-value-added ratio yields over 8% in annual productivity growth.

Figure 7: OECD Defence R&D as a Share of Total Government R&D (2022)



With the right partnerships and support structures, Canada's leading research universities can help build economic resilience, expand the talent pipeline, and deliver the discoveries needed to underpin our sovereignty. Key areas for exploration include:

- **Embedding universities** as core partners in initiatives like BOREALIS to ensure long-term research, innovation, and talent development are integrated from the outset.
- **Aligning investments** with national research hubs in dual-use domains such as AI, quantum, cybersecurity, aerospace, and pandemic preparedness.
- **Establishing a straightforward process** to bring together government, industry, and the research community to align capabilities, identify priorities, and ensure accountability.

By treating research and innovation as strategic assets, Canada can directly link its science and technology base to national security priorities while also catalyzing broader industrial development.

Conclusion

Canada's ability to withstand short-term turbulence will matter, but our future will ultimately be decided by our ability to build long-term resilience. That means investing in the twin pillars of economic and national security—talent and innovation—while building the innovation architecture that translates discovery into industrial capacity.

By doing so, Canada can move from vulnerability to strength, from dependency to sovereignty, and from incremental growth to sustained prosperity. In a rapidly changing world, the choice is not whether to act, but how boldly we will seize this opportunity to secure Canada's future. Budget 2025 must be the moment where ambition is matched by action.