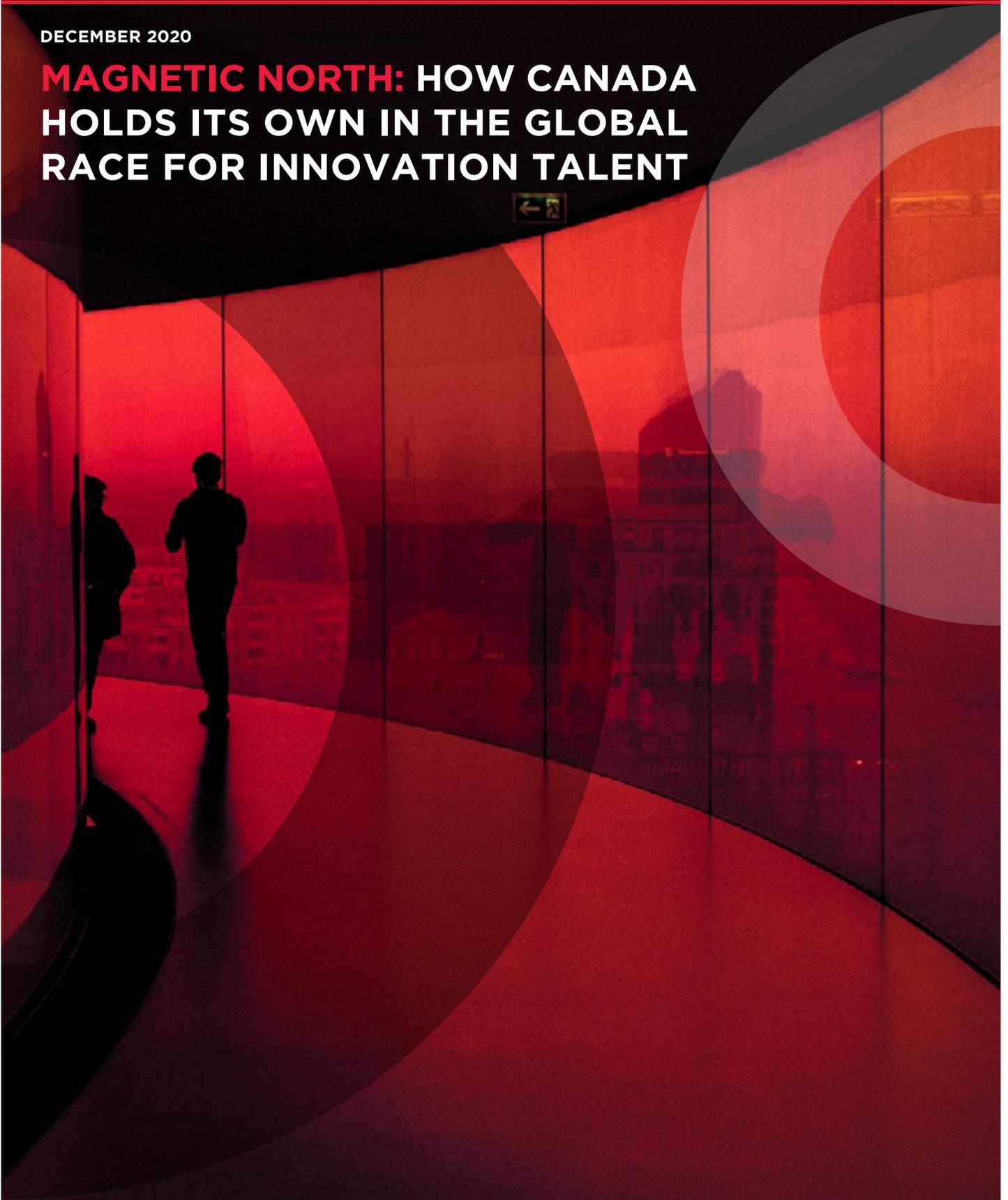


DECEMBER 2020

MAGNETIC NORTH: HOW CANADA HOLDS ITS OWN IN THE GLOBAL RACE FOR INNOVATION TALENT



The Innovation Economy Council

is a coalition of tech-sector leaders dedicated to shaping Canada's industrial innovation policy. Led by MaRS, Ontario Centres of Excellence, DMZ, Invest Ottawa, CCRM, Spark Centre, CENGN, NGen, Mitacs and Ontario Genomics, the IEC works with active members of Canada's innovation ecosystem to identify areas for in-depth analysis and offer timely insights to increase Canadian productivity and sustainable growth.

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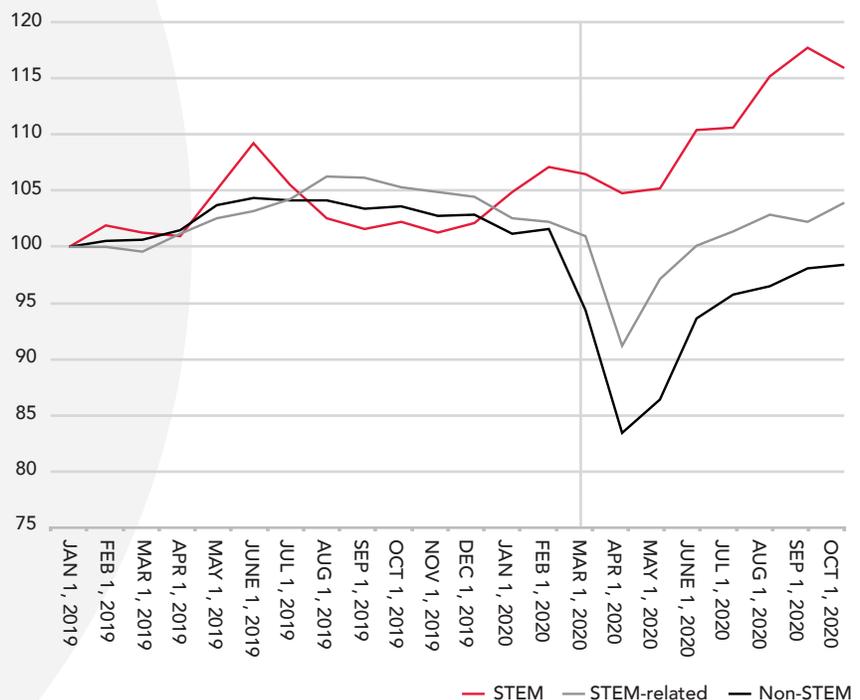
MAGNETIC NORTH: HOW CANADA HOLDS ITS OWN IN THE GLOBAL RACE FOR INNOVATION TALENT

The COVID talent landscape

The pandemic and its aftershocks wiped out about three million jobs in Canada. Many of those have returned, but not all; there were 270,750 fewer jobs in October than there were in February. Our economic landscape remains deeply scarred.

A silver lining in this grim outlook is the remarkable resilience of the knowledge economy. Jobs for STEM workers — engineers, programmers, scientists and the like — are even more plentiful now than they were before the pandemic. Like most other occupations, they took a hit when the economy went into lockdown. But by October, all of those lost jobs had come back, and then some. Employment in STEM occupations was 8.7 percentage points higher in October than it was in February, a net gain of 98,500 jobs. STEM-related employment has also bounced back for workers such as lab technicians and nurses. Employment rose 1.7 percentage points in that sector between February and October, a gain of 61,750 jobs.

NORMALISED EMPLOYMENT: STEM, STEM-RELATED, NON-STEM JANUARY 2019=100%

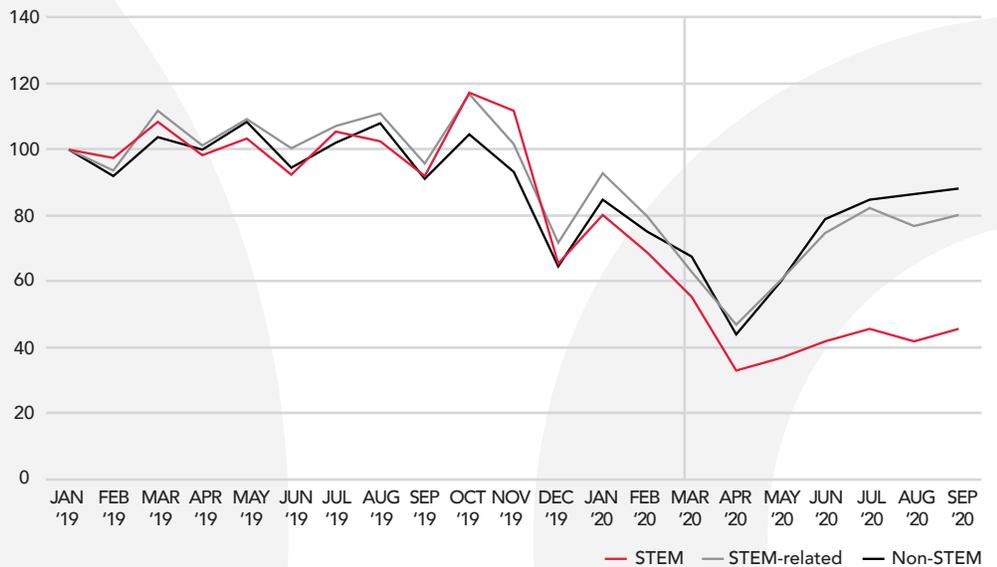


It's a much bleaker picture for the rest of the Canadian job market. Employment in non-STEM occupations is still 3.2 percentage points below where it was in February, a loss of 431,000 jobs.

“It’s a positive sign [for the STEM sector] but maybe not for the economy in general. Jobs haven’t come back and the growth isn’t there,” explains Brittany Feor, an economist at the Ottawa-based Labour Market Information Council (LMIC).

There is one caveat to the generally good news about the job outlook for STEM workers: As of September, postings for new STEM hires were still 50 percent below where they were a year earlier — a much sharper decline than for non-STEM jobs postings, which were down just three percent, according to an Innovation Economy Council analysis of LMIC data.

**NORMALISED JOB POSTINGS: STEM, STEM-RELATED, NON-STEM
JANUARY 2019=100%**



That may simply reflect the greater resilience of many STEM jobs, which generally require higher levels of education and pay better than non-STEM jobs. Despite the economic shock of the pandemic, employers were loath to shed prized STEM talent; indeed, many actively acquired it. Now, with the economy in recovery mode, they don’t need to hire as aggressively to catch up. “The job listings are down a lot, but employers haven’t fired people,” says Tony Bonen, the LMIC’s director of research, data and analytics. “They’re still working remotely.”

Still, sharp declines in job postings may be an early warning sign. After leading the economy in job gains before the pandemic, the pace of hiring in the technology sector may be slowing. “Since COVID, there has been a real disconnect between jobs and job postings in the STEM occupations,” the LMIC’s Feor points out. That’s worth keeping an eye on in 2021.

Remote work is reshaping tech

The pandemic has accelerated a trend that was already taking root in the tech industry, namely the shift to distributed workforces. Large and small companies alike now realize that workers can be productive from virtually

anywhere with a good internet connection. That could be home, another city, even another country. Companies also know they might be able to pay people less in lower-cost locations.

The impetus to spread their workforces around is perhaps greatest for companies in high-cost locations, such as Silicon Valley, Seattle and New York. These cities have traditionally been magnets for tech talent from around the world, including Canada, but the salaries and office space add up.

Many large tech companies now acknowledge that many employees may never return to the office, even after the pandemic. At Google, for example, most employees will be working from home until at least summer 2021. Many other companies, such as Twitter and Slack, are letting employees work from home permanently.

Meanwhile, the appeal of the United States isn't what it was. The high cost of living, congestion, political division, tighter immigration rules, even environmental factors such as wildfires are all conspiring to make that country less attractive to young tech workers.

Foreign companies are tapping Canadian talent

Tech companies have learned that it's no longer essential to bring people to them. They can just as easily set up shop where the talent is, virtually anywhere in the world. That's created new opportunities for Canadian cities with good universities and existing clusters of technology companies, including the Toronto-Waterloo corridor, Ottawa, Montreal, Edmonton and Vancouver.

If their employees can work from nearly anywhere, why not Canada? That's part of the reason why tech colossuses Google, Facebook and Amazon have all opened large offices in Canada in the past five years.

But it's not just the tech behemoths that have discovered the Canadian advantage. Foreign startups are also coming here, eager to hire people with valuable skills in areas such as artificial intelligence and machine learning. In June, New York-based AI security company Behavox committed \$35 million to a multiyear office lease in downtown Montreal to build what it calls its "global operations hub." Behavox now has 120 employees in Montreal and it's adding new ones at a rate of roughly one per day, including engineers with AI and data-science skills. The company expects to have as many as 1,000 employees in the city within three years.

Behavox was drawn to Montreal because of the city's world-renowned AI community, Canada's "smart" immigration policies and the availability of multilingual workers, chief executive Erkin Adylov explains. "We can hire faster in Montreal than anywhere else. There's a really friendly environment to bring talent to Canada, and a deep pool of talent."

Lever, a San Francisco-based human-resources software company, opened a second headquarters in Toronto in 2018, in order to tap engineering talent and better serve its east coast customers. The company currently has 16 job postings on its website, three-quarters of them in Toronto.

Gatik of Palo Alto, Calif., whose autonomous-vehicle tech is being tested by retailers Walmart and Loblaw, opened a Toronto research hub in early 2019 to tap talent from Waterloo, Ont., and the University of Toronto. Of the company's 21 current job postings — mainly software engineers with robotics and AI experience — 13 are in Toronto. Overall, roughly half the company's 45 employees and contractors are here.

"Toronto has been touted as a new Silicon Valley," says Richard Steiner, head of policy and communications for Gatik. "It's not just the talent. The tech ecosystem is thriving. There's no better place than Toronto, as far as we're concerned."

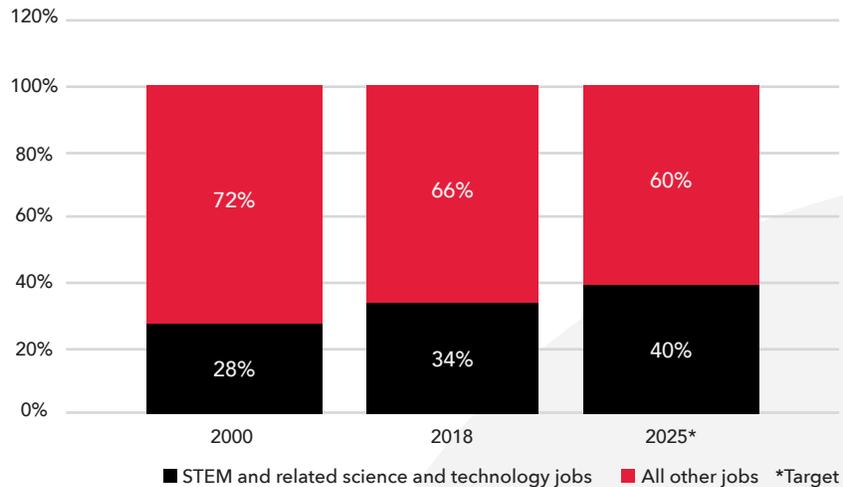
The Canadian advantage for foreign tech companies isn't just talent but economics. The cost of living is significantly less in most Canadian cities than it is in the San Francisco Bay Area and many other U.S. cities. The cheap Canadian dollar and universal healthcare add to a Canadian cost advantage that's reflected in the pay gap. Software engineers, for example, earn an average of U.S.\$145,000 south of the border, according to data from Hired.com, a job postings website. The average pay for those same engineers in Canada is U.S.\$100,000, a discount of nearly 50 percent. That gives technology companies a powerful incentive to establish and expand operations here.

Talent drives the innovation economy

Jobs in the STEM disciplines are the cornerstone of Canada's innovation economy. At the end of 2018, roughly 1.8 million Canadians worked in the digital economy, according to a report by the Information and Communications Technology Council. That number will top two million by 2023 if the tech sector grows nearly twice as fast as the overall economy, as it has been.

Before the pandemic, the knowledge sector's share of the workforce was on a steady upward path. STEM and related science and technology jobs made up 34 percent of the workforce in 2018, up from 28 percent in 2000. The federal government has set a target of growing that share to 40 percent by 2025.

STEM AND RELATED JOBS AS SHARE OF ALL CANADIAN JOBS



Students are apparently getting the message about where the good jobs are in this new economy. Canadian enrolment for STEM disciplines has been growing faster than for all other programs. More than one in three college-bound high-school graduate students are choosing STEM programs. Between 2014 and 2018, STEM enrolment grew 16.4 percent, paced by a nearly 50 percent increase in students entering math and computer-science programs.

Ottawa and many of the provinces are helping to feed this talent pipeline with a variety of levers, including R&D awards, work-integrated learning supports and subsidized university and college co-op placements. For example, Canada's Student Work Placement Program covers up to 75 percent of wages for co-op students.

Mitacs, a non-profit funded by federal, provincial and territorial governments, is also helping to stock Canada's STEM talent pool by subsidizing post-secondary internships, most of them research projects driven by company needs. The organization has tripled the number of placements it offers in the past three years — to 15,000 in 2020, the vast majority of them in STEM disciplines. The governments pay half the cost and the balance comes from the industry partners, which are typically small and mid-sized companies, non-profits, municipalities or hospitals.

"Innovation is created by people, and we want to keep these people in Canada, doing innovation," says Mitacs CEO and scientific director John Hepburn. "When someone has worked on an exciting research project with a Canadian industry [partner], they develop a loyalty, and they are often offered a job right away."

Companies realize what high-quality talent can produce. And the country wins when students have a strong incentive to stay in Canada, according to Hepburn, a chemist and physicist. "The key is creating opportunities and a more innovative ecosystem in Canada," he says.

Brain drain is now brain gain

Over the decades, there has been a lot of national angst about our brain drain — the fear that Canada’s best and brightest minds, particularly those with sought-after STEM skills, are being lured away to the United States with the promise of hefty salaries and brighter opportunities. Nowhere is this concern more pronounced than in the tech sector, where software engineers and programmers are in high demand.

One [recent study](#) by researchers at the University of Toronto and Brock University found that a quarter of recent STEM graduates from three leading Canadian universities are now working outside Canada, mainly in the United States. The findings are sobering. Based on a review of thousands of LinkedIn profiles of graduates from the University of Toronto, the University of Waterloo and the University of British Columbia, researchers found that two-thirds of software engineering graduates, nearly a third of computer-science graduates and 25 percent of all STEM grads leave the country. In interviews, these Canadian expats say they are mainly drawn by the global reputation of U.S. tech giants such as Google and Apple, a greater scope of interesting work and pay that can be up to twice as high as in Canada.

The study’s authors warn that this flight of talent appears to have continued despite the tightening of immigration rules under outgoing U.S. President Donald Trump. They say this suggests that Canada “has failed to address its most stark shortcomings relative to the United States.”

There is some evidence this may be true. For example, the number of Canadians securing H-1B visas in the United States last year rose 41 percent to 4,615, up from 3,273 in 2018. Canada currently ranks third behind India and China in getting these visas, which are earmarked for highly skilled foreign workers, particularly in the tech industry. More than 60 percent of H-1B recipients in 2019 had a master’s degree or PhD. Two-thirds work in computer-related jobs.

But the H-1B program’s future is unclear. Earlier this year, the Trump administration suspended the issuance of new H-1B visas, cutting off one of the main entrées to the United States for foreign tech workers, including thousands of Canadians. President-elect Joe Biden is facing pressure from the tech industry to reverse that move after he’s inaugurated in January.

And just like trade statistics, exports tell only half the story of Canada’s talent balance. The movement of talent is not a one-way flow. Foreign-born workers are vital pieces of Canada’s talent pool. This country continues to be a magnet for people, attracting tens of thousands of highly skilled immigrants, temporary foreign workers and STEM students every year. Federal programs, such as the Global Talent Stream, allow employers to fast-track the entry of highly skilled and high-earning temporary foreign workers, often in a matter of weeks. In 2019, Canada welcomed 4,139 workers through the program.

Overall, of 129,551 temporary foreign workers admitted to Canada in 2019, 5,741 (4.43 percent) were STEM workers.

Much larger numbers of skilled foreign workers come to stay through various immigration programs, such as the federal Skilled Worker Program, Skilled Trades Program and Canadian Experience Class. A fifth of the 85,300 permanent resident offers made in 2019 went to STEM workers, led by software engineers, systems analysts and programmers.

Ottawa recently announced it is boosting Canada's annual target for new permanent residents to 401,000 in 2021, up from 351,000 this year. However, COVID-19 travel restrictions could make the new higher target tough to reach.

With foreign workers facing visa delays and roadblocks in the United States, Canada's open and flexible immigration regime is a key competitive advantage for employers, argues Nathalie Guthrie, director of human resources at the Ottawa-based Centre of Excellence in Next Generation Networks. There are a multitude of ways for workers with skills to get here, and most end up making Canada their home. "Generally, we hire people to come here for work, and then they stay forever," Guthrie says.

Another key to stemming the brain drain is to provide more work opportunities in Canada so the best and brightest STEM graduates never leave. Mitacs, for example, says that three-quarters of the students placed in its private-sector internships end up staying in Canada, versus less than half who do in its baseline group.

There may be another phenomenon driving the inflow of foreign talent: returning expatriates. Canada is now "unambiguously" experiencing a brain gain, insists economist Henry Lotin, a former Canadian diplomat and immigration expert. The reverse flow is partly from a spike in people tapping the Express Entry program for highly skilled workers seeking permanent residency. More importantly, Lotin estimates that 250,000 to 300,000 of the roughly three million Canadian passport holders living in the United States and elsewhere may have returned to Canada since the pandemic hit, many of them for good. He points out that this "surge" of returnees doesn't show up in official tallies of foreign workers and immigrants.

The inflow from the United States, where as many as two million Canadians live, is being driven by tighter immigration rules and the divisive political atmosphere there, says Lotin. The other major source of returnees is Hong Kong, where tens of thousands of Canadians live and are now looking to flee Beijing's crackdown on democracy.

Selling Canada abroad

Industry groups and some Canadian tech companies see an opportunity. They have ramped up efforts this year to attract expat Canadians and workers from third countries worried about their immigration status in the United States. Communitech, the Waterloo-based innovation hub and

advocacy group, has been running “[We Want You](#)” recruiting billboards, emblazoned with a Canadian flag, along Highway 101 in the heart of Silicon Valley and New York’s Times Square.

The objective is to grab the attention of Americans, expat Canadians and other foreigners working in the U.S. tech sector, explains Communitech CEO Iain Klugman. “America has been successful for the past 75 years because they’ve been able to attract the smartest people in the world. Immigrants and children of immigrants have driven innovation in America. We need to be far more competitive on talent, and everything else will follow.”

The campaign garnered media attention across the United States and was seen by millions of people. It drove 280,000 views on Communitech’s website, and dozens of U.S. tech workers have inquired about job opportunities in Canada.

The timing was right because Canada has a new story to tell, Klugman says. It’s now home to a growing collection of interesting tech companies, such as Shopify, OpenText, Dialogue and ApplyBoard, that aren’t primarily focused on addicting people to their mobile devices.

“A lot of people aren’t happy with the behaviour of [Silicon] Valley,” he argues. “Canada has emerged as being different. People mocked us for being polite and saying ‘sorry.’ Now I think people are looking for that, and we’re seeing companies from America and beyond setting up here to tap talent.”

The countries that can attract the best and brightest people will win, he says. But if Canada wants to play in the big leagues, it will eventually have to pay them the going global rate. “The easiest way to recruit talent to your community is to never let them go,” Klugman says.

Immigrants sustain Canadian STEM

Not surprisingly, immigrants make up a disproportionate share of Canada’s STEM workforce — as of 2016, more than half of it, according to Statistics Canada. Foreign-born Canadians accounted for two-thirds of workers with engineering and computer-science degrees.

Many of them arrive in Canada as students, then stay on to launch companies or fill in-demand jobs. Canada is now the world’s third-most popular destination for international students, behind the United States and Australia. In 2019, there were 642,000 international students in Canada, three times the number of a decade ago. And they are disproportionately represented in STEM programs. By comparison, the United States had 1.1 million foreign students last year. Relative to its population size, Canada is vastly outperforming its neighbour in attracting foreign students, and it’s gaining ground every year. Foreign enrolment in Canada is down roughly two percent from 2019, according to Universities Canada, but that’s likely caused by temporary pandemic travel restrictions.

The attractions of a Canadian education remain. Foreign students and their spouses can work in Canada while they're in school. And they can easily extend their stay via work permits after graduation.

For many foreign students, education is a stepping stone to making Canada their permanent home. Sixty percent of foreign students in Canada say they would like to live and work here after they complete their studies, according to research by the Canadian Bureau for International Education. It's a path made easier by a range of welcoming federal and provincial programs that allow foreign students to obtain permanent residency without returning to their home countries, unlike most U.S. visas.

How global tech talent arrives

Ketaki Desai, vice president of business development, Ontario Centres of Excellence

For biomedical scientist Ketaki Desai and her software engineer husband, coming to Canada was Plan B — a backup if their long quest to get U.S. green cards failed.

The Indian-born couple studied, worked and lived in Pittsburgh for most of the past 18 years. They wanted to stay, but years of failed attempts to become permanent residents had left them frustrated and anxious. So, in March, they enacted Plan B and moved to Toronto to reboot their careers.

The welcoming nature of Canada's immigration system was a revelation to Desai, 39, an engineer with a PhD in biomedical sciences. The family secured permanent residency in less than six months, easily clearing the threshold for entry on Canada's immigration points scale.

"Everything from when we applied and when we landed made us rethink our notion of Canada as a backup," she says. "This is a country that really wants us and is showing us in more ways than one, and has welcomed us." It was a sharp contrast to the U.S. system, which Desai says seemed determined to find ways to "not have us there."

She quickly found a job at OCE, an Ontario not-for-profit that subsidizes the commercialization of innovation. Now she helps early-stage startups thrive and grow in Canada. Her husband has started a software consulting business and is contracting back to his former employer, the University of Pittsburgh Medical Center.

Desai says she has no regrets, because Toronto's "explosion" of ideas, people and cultures creates a uniquely vibrant innovation environment. "The diversity of people is not seen as a hindrance. Here, diversity brings perspective and new ways of looking at things," she says.

Natália Moreira, event co-ordinator; and Ricardo Mattiazzi Baumgartner, software developer, Rangle.io

Brazilians Moreira and Mattiazzi Baumgartner came to work in Toronto's burgeoning tech industry by different routes.

Moreira and her husband came to Toronto on vacation in 2016 and fell in love with the city, drawn by its diversity and green spaces. So they returned a year later, and Moreira enrolled in a postgraduate marketing program. A year later, the 34-year-old got a four-month co-op job at software developer Rangle, which hired her full-time. Her husband found work at the same company as an Android software developer. Earlier this year, they became permanent residents.

"We could picture ourselves living here," she says. "Because of the diversity, you feel more welcome as an immigrant. No one judges your accent or your grammatical mistakes."

Mattiazzi Baumgartner, 36, worked in Brazil, New Zealand and Las Vegas before moving to Toronto. He could have extended his U.S. work visa, but says he wanted an opportunity where he could enhance his project management skills. He heard about Rangle, and moved here with his wife on a two-year work permit. Now, he's looking at making the move more permanent by extending his work permit or seeking permanent residency.

"I knew Toronto was a tech hot spot," he says. "There are a lot of tech companies here."

Ozge Yoluk, computational biologist, ProteinQure

Turkish-born Yoluk, 34, was doing postdoctoral work at the University of Maryland in Baltimore. She wanted to stay to find work in the biotech industry, but knew that swapping her G-1 visiting researcher visa into a work permit would be difficult. So she started looking for work in Europe, where she had done her master's and PhD.

Then she met a biologist who worked at ProteinQure, a Toronto-based computational protein drug discovery company, who convinced her to look at Canada. "The industry here is way bigger than I ever imagined," she says. "There are so many startups that are doing well and have collaborations all over the world."

Yoluk applied for a work permit through the Global Talent Stream program, which expedites the entry of highly skilled foreign workers. In 2019, she joined ProteinQure, where she uses 3D modeling to test interactions between atoms that can alter the effectiveness of drugs. Now she's preparing to apply for permanent residency in Canada.

"I wanted a place I could call home, settle down and live," she says. "Toronto has a nice balance between life and work."

Anusha Venugopalan, talent manager, League Inc.

For Venugopalan, the perpetual uncertainty of not knowing when her time in the United States would end was draining. So the 35-year-old tech recruiter and her scientist husband made a plan and moved north.

The couple had been working in the Boston area for nearly three years — she as a recruiter for Facebook, he as a scientist in the biotech industry. But they knew they were living on borrowed time, particularly after the hardening of immigration rules following U.S. President Donald Trump's election in 2016. So, in 2018, she applied for permanent residency in Canada under the Express Entry program for skilled immigrant workers.

The process took more than a year, and included a criminal background check, verification of educational credentials and a language test. Venugopalan was approved in 2019 and moved to Toronto last November, quickly finding a job at League, a fast-growing healthcare benefits company. Her husband followed her later, joining a Quebec biotech firm. They have since moved to Montreal, where Venugopalan works remotely, recruiting talent Canada-wide.

The two are already looking four years down the road when they'll be eligible to apply for Canadian citizenship. "When I speak to candidates in the U.S., they want to move to Canada," she says. "They often have visa issues, as we did."

How to incubate Canadian talent: the Centre for Commercialization of Regenerative Medicine

CCRM president and chief executive officer Michael May says it's never easy when talented scientists leave the organization to pursue careers elsewhere. But it's all for a good cause — namely, seeding the Canadian talent pool in the emerging field of cell and gene therapy.

"Turnover is always challenging," he says. "But being able to feed other companies with people we've trained is a great achievement, particularly if they are championing our spin-offs and partners."

CCRM is a public-private partnership with a mandate to establish Canadian leadership in the emerging global cell and gene therapy industry, in part, by building up Canada's biomanufacturing capability, including the talent base. It is catalyzing a \$200-million commercial-scale biomanufacturing plant in Hamilton, Ont., that will eventually employ 500 people, adding to its current workforce of about 120.

Since launching in 2011, CCRM has become an incubator for startup companies and talent. May says people often join CCRM as graduate scientists, acquiring valuable industry skills along the way in areas such as regulatory affairs, intellectual property, technology development and company development. "We've seen a number of people come through CCRM who are sought after because of the skills they developed here," he says.

Among them is stem-cell biologist Emily Titus, who joined CCRM fresh out of graduate school in 2011. Without CCRM, she likely would have taken a job in Boston or California. “In 2011, there were no companies here focused on stem-cell biology,” Titus says. “CCRM was the one place that I could go and keep my focus in that area.”

At CCRM, Titus supplemented her science knowledge with business skills, eventually leading a team in company creation. That work led to the spin-off of stem cell startup Notch Therapeutics, where she is now vice president of process sciences. “Now we’re creating more job opportunities in this specialized area of stem-cell therapy,” she says.

Jennifer Moody was hired by CCRM as a manager and later left to join partner company BlueRock Therapeutics, headquartered in Cambridge, Mass., but with a large team in Toronto. Now, she’s chief operating officer at Morphocell Technologies, a Montreal-based regenerative medicine startup and one of CCRM’s portfolio companies.

Other CCRM alums have returned to Canada mid-career, as the building blocks of a viable industry take shape.

In the past, it would have been impossible to keep talented people from moving to the United States, let alone to entice them back, May says. But that’s changing as the Canadian ecosystem develops.

“Most tech transfer isn’t through patents or research papers. It happens through people,” he says. “Every invention has an inventor, and they are often grad students. By retaining talent that stays in Canada, that’s how you create an ecosystem.”

11 Canadian companies driving tech recruitment

OpenText, Waterloo

Pandemic response: The Waterloo-based software maker temporarily froze all hiring when the pandemic hit. The company also closed roughly half of its 120 offices around the world, mainly smaller ones, recognizing that remote work was likely to become permanent for many employees.

Hiring strategy: The company, which specializes in enterprise software, is aggressively hiring again, especially in Canada, where 2,500 of its 14,400 employees are located. In early fall, the company made a strategic decision to consolidate much of its hiring in Canada, where it has a nucleus of engineering strength and infrastructure.

“We decided in this uncertain world that we should go to where we have strengths already to ensure that new employees are connected to a community,” says Susan Hailey, vice president of global talent acquisition. “Eventually we’ll all be back in the office and we want people to be geographically close to our hub.”



Susan Hailey
Vice President of Global
Talent Acquisition, OpenText

The company currently has 300 job openings in Canada, including engineers but also staff in professional services and customer support. More than half of its engineering and technical hires this year will be in Canada. It also has roughly 30 co-op students, mainly from the University of Waterloo.

The Canadian advantage: Hailey cites Canada's welcoming immigration regime, the availability of engineering talent in Ontario and salaries that are lower than in many U.S. technology hubs.

Vive Crop Protection, Mississauga

Pandemic response: The maker of crop insecticides and fungicides — developed by University of Toronto scientists — has continued to grow, and hire through the pandemic. CEO Darren Anderson says the pandemic has deepened the pool of available talent, allowing the firm to recruit people beyond its Toronto base.

"We can look at anyone across the U.S. or Canada," he says. "There is a huge pool of incredibly talented people out west, and we now have a greater ability to draw on that talent than we would have thought going into the COVID crisis."

Hiring strategy: The company currently has 37 employees, with a dozen of them added in the past three months. Two-thirds of Vive Crop's workforce is in Canada and one-third is in the United States, where it generates virtually all of its sales. The company expects to more than triple in size within three years. With success come challenges, including talent-poaching by rivals. Anderson says the company is reviewing Canadian and U.S. salaries to make sure it stays competitive. It's also trying to recruit Canadian expats in the United States.

The Canadian advantage: Anderson says the company is a beneficiary of Canada's generous R&D tax credits, business practices that are in line with those in key overseas markets and a deep local pool of affordable chemists, chemical technologists and biologists.

ApplyBoard, Waterloo

Pandemic response: The pandemic has been a boon for ApplyBoard, which operates an online platform linking foreign students to colleges and universities around the world. "We have been leaning in," says Dan Weber, senior director of business innovation. "It's about enabling access to education, and helping make those connections in a virtual world."

The company raised \$100 million in venture capital funding during the pandemic, putting a \$1.4-billion value on the company.

Hiring strategy: The company has added more than 200 employees this year, pushing its workforce over 600. Roughly 400 of these employees are in Canada, mainly Waterloo. ApplyBoard currently has nearly 100 openings in engineering, customer service and sales. Fitting for its mission, 40 percent of employees are immigrants and 65 percent speak a second language.

The Canadian advantage: This country's open and flexible immigration system makes it a "great landing area" for talent, Weber says. The hundreds of thousands of foreign students who come here to study create a ready pool of talent for Canadian tech companies.

Dialogue, Montreal

Pandemic response: Demand is soaring for Dialogue's remote healthcare services. The company has more than doubled in size to 850-plus employees this year, up from 320 before the pandemic. Among the new additions are hundreds of part-time medical practitioners, including nurses and doctors plus software developers, data analysts and product specialists.

Hiring strategy: The company says it is exploring "different options" to tap talent from outside Canada as it strives to fill key tech jobs, according to Sylvain Beauséjour, vice president of human resources. It's also reviewing its wage structure as well as benefits to ensure they remain competitive.

"As companies invest in digital transformation, it leaves more tech roles, than candidates," he explains. "If we can't find the right talent locally then we'll have to expand our scope to look to other markets as well."

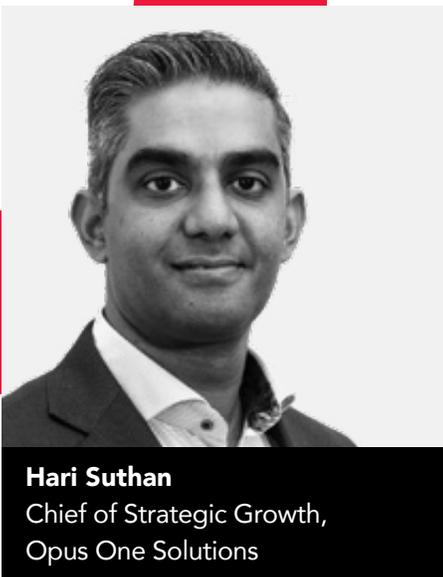
The Canadian advantage: The company gets subsidies from the Quebec government to train managers.

Opus One Solutions, Richmond Hill, ON

Pandemic response: The maker of energy management software immediately cut staff by 10 percent this year to 63 as its utility industry customers retrenched. But it was growing again by late summer as it won new business in the United States, Britain, India and continental Europe, according to Hari Suthan, chief of strategic growth. The company expects to end the year with roughly 75 employees and add up to 10 more in 2021.

Hiring strategy: Opus One is hiring key technical employees, including software developers, optimization engineers and research staff. It has also added key senior executives to help the company scale up. "It's a case of how fast can we hire," Suthan says. "We have been good at winning commercial contracts and now we need to deliver. We need to have people come on board quickly and train them."

Canada's new position as a mecca for global tech companies is creating a shortage of software talent and pushing up salaries, Suthan says. The company has hired several immigrants recently, and it has previously used the Global Talent Stream to recruit temporary foreign workers.



Hari Suthan
Chief of Strategic Growth,
Opus One Solutions

The Canadian advantage: “Canada is a place where people with talent want to live,” says Suthan, who arrived here from Sri Lanka as a refugee at 14. “It is one of our greatest competitive advantages. That is going to help companies like ours find talent over the next 20 to 30 years.”



Cameron Piron
President, Synaptive Medical

Synaptive Medical, Toronto

Pandemic response: The COVID-19 crisis was a jolt to the company’s business of selling medical imaging devices to hospitals. Its staff couldn’t get into hospitals to sell or install equipment. Now the company is seeing a “pretty big rebound,” says president Cameron Piron.

Hiring strategy: The company has 160 employees, roughly 50 of those based in the United States. Synaptive is on course to double in size, so it needs talent at all levels of the organization, including engineering, production, regulatory, patent and quality-control personnel. It recently recruited a chief executive, Marc Buntaine, from south of the border. Piron says Canada lacks experienced medtech corporate leaders with startup, operational and marketing skills, Piron says.

“As we scale up, the skill set changes,” he says. “We are going from revenues of tens of millions to hundreds of millions and beyond.”

To fill the gap, Synaptive has also tapped into a ready supply of tech, auto and aerospace workers whose skills are transferable to medical technology. The company takes in co-op students and invests in training to nurture its senior managers of the future.

The Canadian advantage: Canada is becoming internationally known for its talent in biomedical engineering and image-guided therapeutics, particularly at the research level. Piron says the challenge is to leverage that innovation by continuing to spin out and scale up homegrown companies. Organizations like Ontario Genomics are working to support this.

Conavi Medical, Toronto

Pandemic response: Conavi Medical, which makes intravascular imaging systems, is in the hunt for a CEO to help the 100-person company scale up. Finding the right person at the right price is proving to be a challenge, says co-founder and president Brian Courtney, a scientist and cardiologist at Sunnybrook Health Sciences Centre in Toronto. He says a CEO of a Canadian tech startup might make \$300,000 a year plus stock options. But Conavi will likely only find the right candidate in the United States, where the going rate could reach \$1-million a year in total compensation.

“It’s a dangerous high-risk proposition for a company,” Courtney says. “The selection process has to find the right person, who can change the company, but not so much that it ruins the company.”

Hiring strategy: Conavi has successfully filled senior manufacturing and quality-control positions domestically. Canada's medtech industry is also benefiting from the return of Canadian expats, some of whom are looking for investment opportunities, Courtney says. But there aren't many C-suite candidates willing to return from the United States or elsewhere.

The Canadian advantage: Immigration and social uncertainty is pushing some U.S. talent to leave. But Courtney says the talent pool remains small in Canada.

Security Compass, Toronto

Pandemic response: The cybersecurity company froze all hiring for several months after experiencing a "significant slowing in growth," according to Michelle Brooks, vice president of people and culture. The company has 250 employees, including 215 in Toronto and 20 in the United States.

Hiring strategy: The company is now hiring again, but at a more modest pace. It had planned to have roughly 300 employees by year's end. Instead, it will likely have 255 as it adds software engineers, security consultants and salespeople. Still, Brooks says, "there isn't enough top talent to sustain the need."

The Canadian advantage: Brooks praises the Global Talent Stream program, under which the company has brought in about 10 skilled temporary workers in the past couple of years. "It's a really great program," she says. "It allows high-growth companies to fast-track the process and it reduces the burden on the employer."

InteraXon, Toronto

Pandemic Response: The company, maker of the brain-sensing Muse headband, quickly laid off a handful of people when the pandemic hit. "We certainly saw sales dip," president and chief executive Derek Luke says. "We reacted quickly and got our cost base where it needed to be."

Growth has slowed from last year, but the company is still profitable and is growing again and has resumed hiring. InteraXon currently has 57 employees and three or four vacancies. Filling those positions would leave the company roughly the size it was before the pandemic.

Hiring strategy: The company experimented with remote work before COVID-19 and has now embraced it. The company hired a marketer in Los Angeles and a machine-learning expert in Colombia. Luke is second-guessing the money it committed to renew the lease on its Toronto headquarters. "That's money I could use for growth," he says.



Derek Luke
CEO, InteraXon

The Canadian advantage: It's getting more difficult to find skilled programmers, including in-demand experts in machine learning and artificial intelligence, according to Luke. The salary differential for key skills is narrowing around the globe. "Canadian companies need to look at what the world is paying, rather than local market rates," he says.

B2B Quotes, Montreal

Pandemic response: The company has continued to hire throughout the pandemic to meet growing demand, according to chief executive and co-founder Mathieu Plante. "We are in an industry that is thriving because businesses are going online to get things done," Plante says.

B2B Quotes is an online platform that matches employers to independent service providers. The company has grown from seven to 21 employees since March, and is looking to reach 30 next year. The pandemic has vastly expanded the pool of talent by allowing its employees to work remotely, even from other countries.

Hiring strategy: Plante says the company has been able to pick up good people at "discounted" salaries as other employers make layoffs, including human-resources personnel. It tries to offset slightly lower pay by offering people generous vacation time and greater autonomy. "We need to accelerate while other people are being cautious," he says.

The Canadian advantage: "Companies have no choice but to go online," Plante says. "If you want to sell, you need to be online, regardless of what industry you're in."

Rangle.io, Toronto

Pandemic response: The software developer's customers curtailed spending when the pandemic hit. Rangle responded by cutting its workforce by 35 percent, to 140 employees.

Hiring strategy: Chief executive and founder Nick Van Weerdenburg said the company has "turned the corner" and business is picking up again, so it's hiring, with plans to add 10 people by year's end and another 20 in early 2021. "Our customers are more afraid of not being digital enough than they are of COVID," Van Weerdenburg explains.

The Canadian advantage: Canada's relatively open immigration regime is a big plus for the company. "There is a lot of talent out there, and it's not that hard to bring people in if they're qualified," he says.



Nick Van Weerdenburg
Founder and CEO, Rangle.io

A call to action

The innovation economy isn't just about ideas: It's an international war for talented people with specialized skills and experience. Canada has fought this battle well in recent years, assisted by the self-defeating, anti-immigration rhetoric of the United States, and now the remote-work strategies we've adopted because of the pandemic. But we can't take winning for granted. We have to constantly work to build the kind of country where talented people want to live and build careers.

That means creating the right educational and training programs. It also means providing the kind of opportunities that attract talented people, from recent graduates to experienced tech leaders. It means implementing supportive policies, mechanisms and organizations to help ideas graduate from the academic world to the world of commerce, where they can fuel employment and economic growth at scale — a longstanding gap in Canada's innovation economy. It means looking for talent bargains where they can be had, but also paying competitive global salaries when it's required. And not least of all, it means careful evaluation and support of our talent stream and immigration policies that can give our country a leg up on many would-be competitors.

Even with all those advantages in place, Canadians will always leave to find their way in the world. We can't retain everyone. As this report shows, STEM graduates are still flocking to the United States on H-1B visas. But we can still win the talent war when we replace Canadians who leave or lure expatriates home again; we currently have a net brain gain due to immigration. American rhetoric pushing for H-1B visa restrictions has worked in our favour in the public-relations realm. Because the war for talent is fought on the editorial pages, we need to keep making our story heard. Every company, every innovation hub, every government must look for ways to sell talented people on Canada. In doing so, they will be recognizing that this battle must be fought over and over again — it's never truly won.

Executive summary

A thriving innovation economy depends on companies with great ideas. But great people are just as important.

Canada's fast-growing technology sector appears to be holding its own in the global race for talent, even after the economic shock of the COVID-19 pandemic, according to an analysis of employment data by the Innovation Economy Council. Indeed, jobs in STEM fields — science, technology, engineering and math — are holding up much better than employment in the rest of the Canadian economy. After an initial dip, there are now nearly 100,000 more STEM jobs than there were in February. Companies and organizations absorbed the economic hit, pivoted to remote work and quickly resumed hiring.

The resilience of tech employment in uncertain times is a testament to some of the sector's key strengths: an immigration system that welcomes skilled foreigners, a steadily growing crop of post-secondary STEM graduates, generous R&D tax credits and a thriving ecosystem of startup companies. Foreign tech giants and emerging companies alike are building operations here to tap our talent in artificial intelligence, cloud computing, bioengineering and other fields. The federal Global Talent Stream program is bringing senior talent to Canada. This all suggests that Canada is on the right track.

Complacency, however, is not a strategy. Many of Canada's top STEM graduates are still drawn to U.S. tech hubs in places like Silicon Valley, Seattle and Boston, attracted by hefty salaries and the cachet of careers with top global brands. Canadian companies must work harder to create opportunities so people don't leave, but also to lure them back after they've gained valuable foreign experience.

It's not assured that Canada's advanced industries will be able to sustain the momentum they had before COVID-19. While tech companies are hiring again, data compiled by the IEC shows that job postings for STEM jobs are down 50 percent from where they were in February — a possible indication that industry momentum is slowing.



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