Growing Ontario's Critical Industries: Universities Generating Talent

Ontario's future prosperity depends on expanding the industries and innovation that create jobs, attract investment and enhance competitiveness. While universities are central to protecting Ontario's competitiveness today, they are equally critical to growing the economy of tomorrow. Universities are uniquely positioned to grow the talent, technology and research needed in key industries by:

- Growing the pipeline of nurses, doctors and researchers who are essential to protecting Ontario's health system and building a life sciences sector that attracts investment.
- Expanding Ontario's leadership in EV production, battery technology, and clean mobility – creating good-paying jobs and strengthening the province's advanced manufacturing sector.
- Training the next generation of computer scientists, engineers, and entrepreneurs to grow Ontario's tech sector and make the province a global leader in AI applications.
- Building the talent and innovation needed to responsibly develop Ontario's critical minerals, support clean energy projects and grow a sustainable supply chain for the future.
- Partnering with government and industry to grow Ontario's defence and cybersecurity capacity – protecting the province's infrastructure and ensuring economic resilience.
- Advancing expertise in nuclear energy and small modular reactors to provide Ontario with clean, reliable power that supports industrial growth, reduces emissions, and secures energy independence.

Strategic investment in universities will not only strengthen these critical sectors but also ensure Ontario remains a leader on the global stage. But a stronger foundation is urgently needed to ensure Ontario can both meet today's workforce demands and grow the industries that will drive prosperity for generations to come.

The following impact stories demonstrate how universities are not just responding to today's needs, but preparing students for the careers and jobs that Ontario needs while actively growing the industries and opportunities that will define the province's future prosperity.

Artificial Intelligence and Digital Innovation

"AI could unlock billions of dollars in economic value for Ontario, but only if we make it accessible to all businesses and equip our workforce with job-ready AI skills." – Daniel Tisch, President & CEO, Ontario Chamber of Commerce, Future-Proofing Ontario: Seizing AI's Economic Potential, June 2025

- Ontario's cybersecurity workforce is growing, and businesses are better protected, through the training and support delivered by Toronto Metropolitan University's Rogers Cybersecure Catalyst.
- SciNet, the supercomputing centre at the University of Toronto, provides researchers across Canada with computational resources that translate to greater competitiveness for Ontario's economy. A new $42.5 million investment through the Canadia Sovereign AI Compute Strategy delivered by the Digital Research Alliance of Canada will catalyze support for SciNet from the university and the federal and provincial governments.
- AI-powered innovations improving health care, clean energy, and advanced manufacturing are being accelerated at the University of Waterloo's Velocity startup incubator, generating job growth across the province.
- Access to affordable IP education and commercialization support is growing across Ontario's startup ecosystem through Wilfrid Laurier University's Intellectual Property Lab that helps entrepreneurs and innovators protect and scale their ideas.
- At York University's Climate Data Driven Design Facility, researchers are working with industry partner Printerra to use 3 D printed concrete to develop climate resilient, efficiently produced materials for infrastructure such as housing, roads, bridges and tunnels. The facility analyzes how changing climate conditions affect these materials and uses AI to build predictive models that improve long term performance.

Quantum Computing and Quantum Technologies

"Researching and developing real-world quantum solutions requires a quantum-ready workforce. Canada has the right ecosystem of post-secondary and research institutions and industry partners to build this workforce," – Dr. Anindya Sen, acting executive director of the University of Waterloo Cybersecurity & Privacy Institute, Exploring Canada's Quantum Future, May 2024

- McMaster University supports Ontario's quantum capabilities through research in quantum materials, condensed matter physics, and quantum sensing, with strong links to advanced manufacturing, materials science, and applied industrial research.
- University of Ottawa advances quantum science through leading research in quantum photonics, quantum communication, and extreme light–matter interactions, strengthened by international collaboration through joint initiatives with the Max Planck Society.
- University of Toronto contributes to Ontario's quantum strength through interdisciplinary research in quantum computing, quantum materials, and quantum-enabled AI, supported by world-class physics and engineering expertise and close links to national research infrastructure and industry partners.
- University of Waterloo Institute for Quantum Computing plays a key role in quantum computing, quantum information science, and quantum materials, supported by deep integration with industry and startups through the Institute for Quantum Computing and the broader Waterloo innovation corridor.

Defence and Security

"Universities are central to strengthening Canada's defence capability, from developing vaccines that protect troops and civilians during global outbreaks, to advancing clean-energy technologies that reduce military-chain risk, to supporting Artic communities that anchor our sovereignty in the North. Engineers, analysts, and cybersecurity specialists are as vital to national security as pilots or infantry." – Gabriel Miller, President and Chief Executive Officer of Universities Canada, Science, cyber, engineering and tech experts will defend our sovereignty in the 21st century, The Hill Times, Nov 2025

- Through programs like the Canada Cyber Foundry (CCF), the University of Guelph is advancing research in national security, cybersecurity, and defence technologies to strengthen Canada's readiness for emerging threats.
- Ontario's critical power systems are becoming more resilient through Lakehead University technology that can detect and stop cyber-attacks even after traditional cyber-layer defences are breached.
- Future leaders in policing, corrections and broader justice roles are being prepared with hands-on training and real-world placements through Nipissing University's Criminal Justice program, helping strengthen Ontario's criminal justice sector.
- York University's Lassonde School of Engineering and Centre for Research in Earth and Space Science (CRESS) anchor a uniquely comprehensive space engineering ecosystem that integrates talent development, cutting-edge research, and innovation.

The Ontario Chamber of Commerce and the Council of Ontario Universities jointly endorsed Premier Doug Ford's bid to locate the global headquarters of the Defence, Security and Resilience Bank in Toronto. The Bank's global headquarters would be well supported by a province-wide talent pipeline and world-class research capacity that is anchored by Ontario's globally connected defence and innovation ecosystem and the region's unmatched global capital markets."

Critical Minerals and Clean Technologies

"Canada's mining workforce is growing. The demand for metals and minerals, sustainably sourced raw materials and high standards of environmental stewardship and community engagement mean that a diverse, skilled and knowledgeable mining workforce is increasingly important." – The Mining Story 2025, The Mining Association of Canada, May 2025

- Ontario's ability to identify and develop new mineral deposits is improving due to breakthrough mapping and discovery work from Laurentian University's Metal Earth program.
- Lower-grade resources are becoming viable for lithium production, advancing sustainable critical minerals development in Ontario through partnerships between Queen's University, Rock Tech Lithium and Stark Technologies.
- Accurate, real-time water monitoring is becoming more accessible through innovative, budget-friendly AI sensor technology emerging from Trent University.

Life Sciences and Health Care Innovation

"Ontario is home to some of the world's leading academic institutions, research centers, hospitals, and innovation hubs, and boasts top talent in artificial intelligence, machine learning, data and analytics, and software and infrastructure engineering. Companies like Roche continue to invest in this vibrant life sciences ecosystem because of the talent here, the collaborative environment, and because there is a deep-seated willingness to work locally and globally to innovate for maximum impact." – Brigitte Nolet, President & CEO, Roche Canada Pharma

- Sustainable farming and biotechnology are advancing through new insights into how plants naturally produce protective compounds, uncovered by a researcher at Algoma University.
- Rapid response treatment for infectious disease outbreaks is improving health security through a deployable modular patient-care unit developed by researchers at Carleton University, providing an innovative and standardized solution to health emergencies.
- High risk fetal surgeries are becoming safer through realistic, tactile silicone models developed by researchers at OCAD University that let surgeons rehearse procedures before operating on real patients.
- University of Toronto plays a significant role in Ontario's life sciences ecosystem, with broad research strengths across biomedical science, genomics, regenerative medicine, neuroscience, and clinical translation, supported by close collaboration with teaching hospitals, industry partners, and national research infrastructure.
- Breakthroughs in brain science are helping shape treatments and interventions for neurological conditions through the cutting-edge research conducted at Western University's Institute for Neuroscience.
- York University's Centre for Vision Research is a global leader advancing human and machine vision through the use of leading edge tools such as 3T fMRI, immersive VR, and visuo robotic platforms.

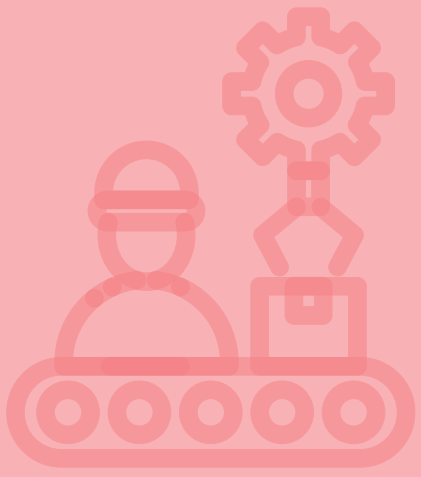
Nuclear Energy

"Ontario has an amazing engineering talent pool, strong academic research programs, as well as a desire to reduce carbon emissions, and boost the Canadian economy and job market. Leveraging its engineering talent and academic strength, Ontario is well-positioned to continue to innovate nuclear technology, developing advanced reactors and improving safety measures. This combination of expertise and research capability can lead to breakthroughs in nuclear energy that not only benefit the province but also set global standards." – Ontario Society of Professional Engineers, Nuclear Power: Why Ontario? And Why Now?, July 2024

- McMaster University is advancing Ontario's nuclear sector by training the next generation of nuclear professionals through hands-on engineering education and applied research, supported by the McMaster Nuclear Reactor, with work spanning reactor safety and materials, medical isotope production, and nuclear energy applications.
- Ontario Tech University supports Ontario's SMR priorities through SMR-focused courses in its undergraduate, graduate and Nuclear Career Accelerator programs, strengthened by research conducted through Canada's only International Atomic Energy Agency Collaborating Centre and the Centre for Small Modular Reactors.
- Advances in low dose radiation research are supporting safer energy and medical practices in Ontario through a joint initiative between the University of Ottawa and Canadian Nuclear Laboratories.

Advanced Manufacturing

"One of the key tools we have at our disposal in times of economic challenges is a resilient and highly skilled workforce. Our world-class postsecondary sector is well positioned to partner with industry and help to furnish Canada's workforce with the skills that give our national economy a world-wide competitive advantage, and contribute to our prosperity." – Robert Luke, Chief Executive Officer, eCampus Ontario, Keep Calm and Keep Training, CME's second annual workforce report, May 2025



- Ontario's grape-and-wine industry is adopting new technology, improving product quality, and building climate resilience through the advanced research, education and expertise of Brock University's Cool Climate Oenology and Viticulture Institute.
- Ontario manufacturers are solving real-world production challenges – from prototyping to scaling – through partnerships with McMaster University's Manufacturing Research Institute.
- University of Toronto is a global-scale research leader in materials science, advanced robotics, AI-driven manufacturing systems, and semiconductor-related manufacturing, closely linked to industry and national research infrastructure.
- University of Waterloo is a leading centre for advanced manufacturing research, with strengths spanning robotics and automation, additive manufacturing, mechatronics, and AI-enabled production systems, supported by deep industry collaboration, commercialization activity, and an integrated co-operative education model.
- Western University supports advanced manufacturing through applied research and industry collaboration, with strengths in lightweight materials, automotive and aerospace manufacturing, surface engineering, and digitally enabled production technologies.
- Next-generation EV battery technology is advancing in Ontario through a partnership with NEO Battery Materials to develop and commercialize innovative silicon-anode solutions with the University of Windsor.