NGen Next Generation Manufacturing Canada

Industry-Led Collaboration

Ground-Breaking Innovation

Workforce Development

Shared Insight and Resources

Provincial Report: Ontario, 2021

September 2021

NGen Update:

Ontario

NGen's projects and initiatives are making a real life impact across Canada.

Ontario companies are building world-leading advanced manufacturing capabilities that are helping Canadians battle the COVID-19 pandemic, improving environmental sustainability, and developing new digital and high-performance technology applications boosting the competitiveness and growth potential of Canadian manufacturers from coast to coast.

Next Generation Manufacturing Canada (NGen) is the industry-led network committed to enhancing Canada's advanced manufacturing capabilities for the benefit of Canadians. NGen leads Canada's Advanced Manufacturing Supercluster. It works to combine research, technology, manufacturing, and workforce strengths across the country to accelerate the development, adoption, scale-up, and commercialization of innovative solutions that enhance the competitiveness and growth of Canada's manufacturing sector, add value and new jobs to the Canadian economy, and tackle some of society's most pressing challenges like health care, food and supply chain security, and environmental sustainability.

NGen works to identify, promote, connect, and strengthen collaboration among experts, companies, and organizations that contribute to advanced manufacturing in Canada. It funds and supports transformative, industry-led, collaborative innovation projects with the potential to deliver significant economic and social benefits for Canadians. NGen also leads initiatives that improve access for smaller companies to education, training, and testing facilities across Canada and that enhance the skills and management capabilities of Canada's advanced manufacturing workforce.

Ontario
Highlights.

NGen Membership.

2,354 Ontario companies, experts, and organizations have joined NGen's advanced manufacturing network.

Project Participation.

204 Ontario companies and research centres are partnering in 91 world-leading advanced manufacturing projects funded by NGen.

NGen Investments.

NGen has approved investments of $157.2 million in projects involving Ontario partners, with total innovation spending estimated at $379.7 million.

Economic Impact.

Projects involving Ontario partners will create more than 10,000 jobs over the next five years.

Membership.

In Ontario, 2,354 manufacturers, technology providers, academic institutions, research and innovation centres, business networks, and public sector partners are members of NGen's advanced manufacturing network. They represent 58% of NGen's 4,030 members from across Canada. NGen membership is open to any expert, company, or organization actively contributing to building advanced manufacturing capabilities in Canada. Members have access to NGen project funding, business and support services, as well as to a network that allows them to identify potential partners, business opportunities, and industry best practices.

Advanced Manufacturing Projects.

NGen co-invests with industry in collaborative projects that have the potential to transform manufacturing processes, lead to significant commercial opportunities, and contribute to Canada's advanced manufacturing ecosystem through the transfer of knowledge and intellectual property.

NGen-funded projects combine research, technology, and manufacturing capabilities in the development and scale-up of novel manufacturing processes. Collaboration provides project partners with innovation, scale-up, and commercial opportunities they would not be able to achieve on their own. Licensing agreements allow IP arising in projects to be shared with NGen members and applied across manufacturing sectors.

To date, NGen has approved investments of $203.3 million in 129 projects across Canada leveraging an estimated $497.2 million to total innovation spending. NGen's project portfolio involves 294 industry and 56 academic and research partners from across the country – 264 (90%) of the industry partners participating in NGen-funded projects are SMEs. One quarter of NGen-funded projects involve interprovincial collaboration among project partners.

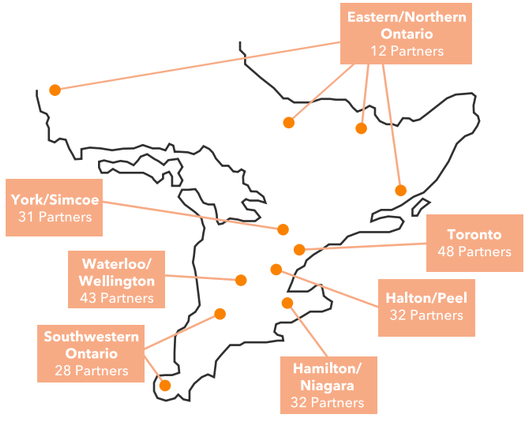
NGen has approved investments of $157.2 million in 91 projects involving 204 industry and research partners based in Ontario, which will lead to an estimated $379.7 million in total innovation spending. There are 14 Ontario colleges and universities and 190 Ontario companies partnering in these projects – 20 (just over 10%) of the industry partners are SMEs.

Ontario project partners are collaborating locally as well as with companies and research institutions across the province and across Canada. Of the 91 projects in which Ontario partners are engaged, 25 involve collaboration with partners in other provinces and 33 involve partnerships in different regions of the province. Another 33 projects involve more local partnerships.

To date, projects involving Ontario partners have generated more than $1.1 billion in sales and licensing revenue. As projects progress and their results are commercialized, they are expected to create more than 10,000 jobs over the next five years.

All regions of the province are benefiting from NGen's project investments.

Location of Ontario Project Partners.



Ontario Companies Leading the Way.

Ontario companies and researchers have led in the fight against COVID-19. Here are some great examples of advanced manufacturing at work:

- Mosaic Manufacturing, Rockmass Technologies, and Redetec in **Toronto** along with partner Glia in **London** developed a distributed system for 3-D printing protective face shields.
- Burloak in **Oakville** also stepped up to manufacture face shields, as did Molded Precision Components in **Oro-Medonte** working along with Sterling Industries in **Concord** and an extensive community of supply chain partners.
- Precision Biomonitoring in **Guelph** and Evik Diagnostics in **Kanata** developed COVID-19 test kits now in use in Canadian airports.
- International Point of Care in **Toronto**, Precision Biomonitoring in **Guelph**, Immune Response Diagnostics in **Toronto**, and Suncor in Calgary are scaling up production of COVID-19 test kits.

Ontario Companies

Leading the Way.

- Runnymede Health Care Centre in **Toronto** helped test a novel nano-technology test kit developed by Sona Nanotech in Halifax.
- Cloud DX in **Kitchener** developed a digital device to monitor patient health to help solve the hallway medicine crisis
- Eclipse Automation in **Cambridge** automated the production of N-95 masks.
- Harbour Technologies in **Windsor** is also working with Novo Textiles in Coquitlam, BC to automate N-95 mask manufacturing.
- Myant in **Toronto** is manufacturing a textile-based wearable health monitoring system
- GlobalDWS in **Toronto** developed a robotic disinfection system to fight the spread of the COVID-19 virus.
- PrescientX in **Cambridge** partnered with Clearpath in **Kitchener** to produce "Violet", an autonomous UV-disinfecting robot for sanitizing workplaces.
- CrossWing in **Aurora** also developed and is currently producing autonomous disinfecting robots using both mist and UV technologies.
- Envision SQ in **Guelph** scaled up production of a self-sterilization coating to prevent viral contamination of surfaces.
- McRae Imaging in **Mississauga**, Dot Automation in **Vaughan**, and Lumentra in **Toronto** are partnering to develop and manufacture nanomaterial coatings for antimicrobial shielding of shared spaces.
- Carmina de Young Fashion Design in **London** is working with Optima Colour in **Brantford** to develop a life-cycle management system for PPE.
- BIG-nano and Swenco in **Waterloo**, IPC Technologies in **Cambridge**, and APC Filtration in **Brantford** are working with Titan Clean Energy products in Craik, Saskatchewan to develop a nano-fibre melt-blown production system for PPE and air purification filters.
- BIG-nano and Titan Clean Energy Products are undertaking another project with Canada Masq in **Markham**, Panther Industries in Davidson, SK and K&S Potash in Saskatoon that will develop a globally competitive system for melt-blown resin and fabric production for PPE.
- BIG-nano is also partnering with PrescientX to develop and manufacture a N100 mask that will provide full protection against aerosol-spread viruses
- Fine Cotton Factory in **Toronto** and Microbonds in **Markham** are scaling up production of metal-infused antimicrobial textiles.
- MPC in **Oro-Medonte** and Niigon in **Vaughan** are setting up an automated system for producing, bottling, and packaging sanitizing solutions.

Ontario companies are also developing unique solutions for manufacturing based on digital technologies, new materials, automation and robotics. Their projects are building a more competitive manufacturing sector in the province by improving productivity, scaling up production, and enhancing opportunities for business growth. Even more important are the benefits they are delivering to Canadians in the form of improvements in health care, environmental sustainability, food security, and supply chain reliability. Here are some more examples of Ontario participation in world-leading collaborative advanced manufacturing projects supported by NGen:

Ontario Companies Leading the Way.

- AiimSense and Sorena Tech in **Waterloo** worked with researchers at the University of Waterloo, Georgian College, and Grand River Hospital in **Kitchener** to develop a prototype for a portable brain scanner using electromagnetic imaging and artificial intelligence that will allow for the earlier and more rapid diagnosis of stroke

- Aspire Food Group based in **Toronto** is partnering with Darwin AI in **Waterloo**, TELUS in Vancouver, and researchers at Western, McGill, and Laval Universities and the Universities of **Guelph**, **Toronto**, and **Waterloo** to develop advanced manufacturing processes for producing high-quality proteins at a new facility in **London**, ON.

- ArcelorMittal Dofasco in **Hamilton** is partnering with IBM Canada, Tenova Goodfellow in **Mississauga**, i-50 in **Windsor**, and researchers from McMaster University and Mohawk College to digitize its steel production process.

- Formula Solutions and AXYZ Automation Group in **Burlington** are working together with Promation in **Oakville** and Weber Manufacturing in **Midland**, as well as with researchers and students at McMaster University and Mohawk and Fanshawe Colleges to automate and scale up the production of engineered carbon fibre parts, which will help to position Canada as a leader in the production of aerospace components from complex materials.

- KSL Lubricants and Wolfdale Tool & Stamping in **Mississauga** are developing a superabsorbent lubricant that will improve tool life and reduce costs for the automotive stamping industry.

- Forcen in **Toronto** is partnering with Sanctuary Cognitive Systems in Vancouver and researchers at Western University to engineer a robotic hand for small part assembly and manipulation, which has the potential to transform advanced manufacturing by expanding the automation of small complex parts.

- Accuenergy in **Toronto** is partnering with Panevo Services in Vancouver and Saputo Dairy Products based in St.-Laurent, QC to develop a real-time monitoring and advanced analytics platform enabling the optimization of overall efficiency of equipment and automation systems in food processing.

- Mosaic Manufacturing, Objex Unlimited, ReDeTec, and Athletic Knit, all based in Toronto, are working together to develop an automated additive manufacturing process that will enable the economic scale up of 3-D printing using multiple materials and technology platforms.

- Axiom Plastics in **Aurora** is partnering with MS Falcon in **Toronto**, Kytech Machine Works in **Mount Albert**, and Bulldog Polymers in **Alliston** to develop a technology that will eliminate visual transitions between different types of plastics used in automotive, aerospace, medical device, heavy equipment, and sports equipment manufacturing.

- CG Belle Industries in **Oshawa** and Spectra Devices in **London** are developing an advanced manufacturing process for removing coatings from metal surfaces using laser technology, eliminating the use of toxic chemicals in the automotive sector.

- AIXEL in **Kitchener**, Riverside Natural Foods in **Vaughan**, Axion Plastics in **Aurora**, and Terra Cotta Foods in **Georgetown** have come together to develop an AI-powered camera solution that automates visual quality inspection with applications in industries like automotive, plastics, and food and beverage manufacturing.

- Kepstrum in **Vaughan** and Stackpole in **Ancaster** are developing algorithms that can be used to identify complex production problems that cannot be detected by current quality control systems, which will reduce the rate of recalls in the automotive industry.

- Evercloak in **Kitchener** and Zen Graphene Solutions in **Thunder Bay** are working together to develop a process for manufacturing graphene and thin-film membranes used in the cleantech sector.

- Conrex Steel in **Toronto**, Macrodyne Technologies in **Concord**, Source Industrial Services in **Brampton**, and researchers from Ryerson University are building the world's most sophisticated steel forming press that will revolutionize the manufacturing of large panels for Canada's shipbuilding industry.

- Molded Precision Components in **Oro Medonte** and Niigon Machines in

September 2021

Ontario Companies

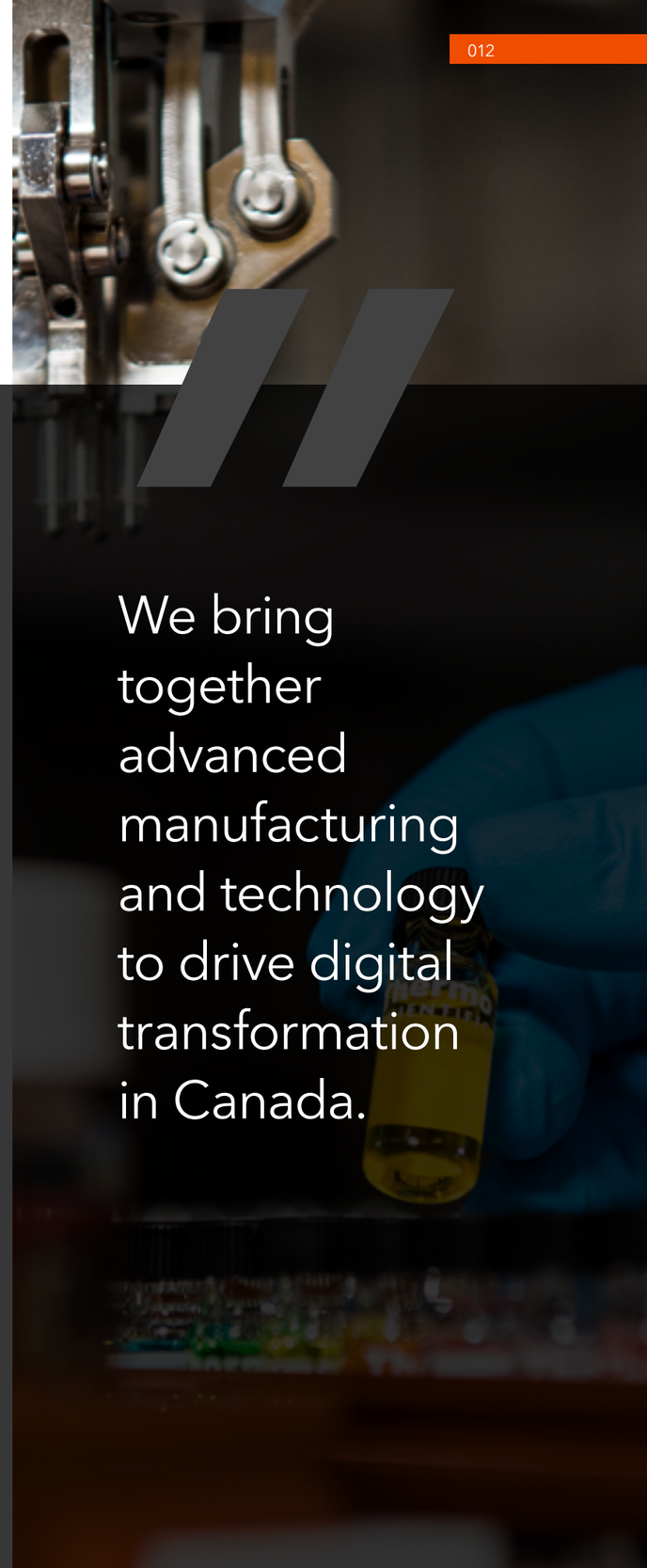
Leading the Way.

Vaughan are developing a new cube molding technology that will transform the way auto parts are made, increasing productivity and reducing costs by up to 50%. The project also provides extensive training opportunities for students at Georgian College.

- Addem Labs and COREEngineering in **Toronto** are working on the development of a state-of-the-art circuit board manufacturing facility in Ontario in order to attract electronics suppliers to Canada and provide an ultra-clean option to manufacture electronics in record time.
- Nano CNet and Evercloak in **Waterloo** are working together along with researchers at the University of Waterloo to automate continuous printing of transparent electronic conductors and heaters.

In addition to advanced manufacturing projects, NGen has supported the development and growth of the Wood Manufacturing Cluster of Ontario based in **Hanover**, the Ontario Aerospace Council working out of **Toronto**, the Canadian Association of Mold Makers based in **Windsor**, the Canadian Association of PPE Manufacturers based in **Cambridge**, the Canadian Centre for Regenerative Medicine based in **Toronto**, the Excellence in Manufacturing Consortium based in **Owen Sound**, and the Trillium Network for Advanced Manufacturing based in **London**. These advanced manufacturing clusters have members across the province. NGen support has allowed them to connect with other advanced manufacturing networks across Canada, share best practices, and develop new performance enhancement and business opportunities for their members.

NGen is also partnering with 16 of Ontario's post-secondary institutions in its advanced manufacturing workforce and management development initiatives, including St. Clair College and the University of **Windsor**, Western University and Fanshawe College in **London**, McMaster University and Mohawk College in **Hamilton**, the University of **Toronto**, Ryerson, George Brown, Humber, Centennial, Sheridan, and Seneca Colleges in **Toronto**, the University of **Waterloo** and Conestoga College in **Kitchener/ Cambridge**, and Georgian College in **Barrie**. The schools contribute to NGen's Advanced Manufacturing Productivity Upskilling Program (AMPUP) and have supported the development of manufacturing leadership, strategic analytics, and student curricula in fields like electric vehicles, PPE and health care supply chains, innovation opportunities related to the life cycle management of plastics, development of a circular economy model for Ontario's agriculture and food sector, and future skills requirements for advanced manufacturing.



We bring together advanced manufacturing and technology to drive digital transformation in Canada.

More to Come
Ontario.

More projects have yet to be announced! Ontario companies will be working to develop and produce new materials to improve environmental sustainability, new systems to enhance energy storage and develop the Electric Vehicle value chain, new ways of processing metals and other materials, as well as innovative automation and robotics solutions that will be applied in a variety of manufacturing applications.

The innovation coming from Ontario industry is truly ground-breaking. The economic benefits to the province in the form of new investment, jobs, and commercial opportunities are significant. Even more important, however, are the benefits these projects will deliver Ontarians and Canadians in improving environmental management, reducing carbon emissions, developing better ways to ensure food security, improving health care – and saving lives.

Learn more about NGen and keep an eye out for new project announcements at www.ngen.ca.

Contact

Website

www.ngen.ca

Email

General: info@ngen.ca

Projects: project@ngen.ca

Training: upskilling@ngen.ca

Social Media

LinkedIn

Twitter

Instagram

Address

175 Longwood Rd. S, #301
Hamilton, ON L8P 0A1

NGen's industry-led approach enables private sector leaders to pursue game changing, market-driven innovations.