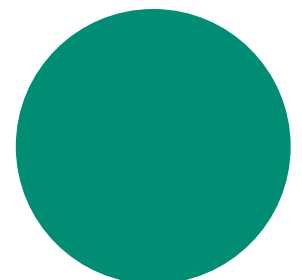
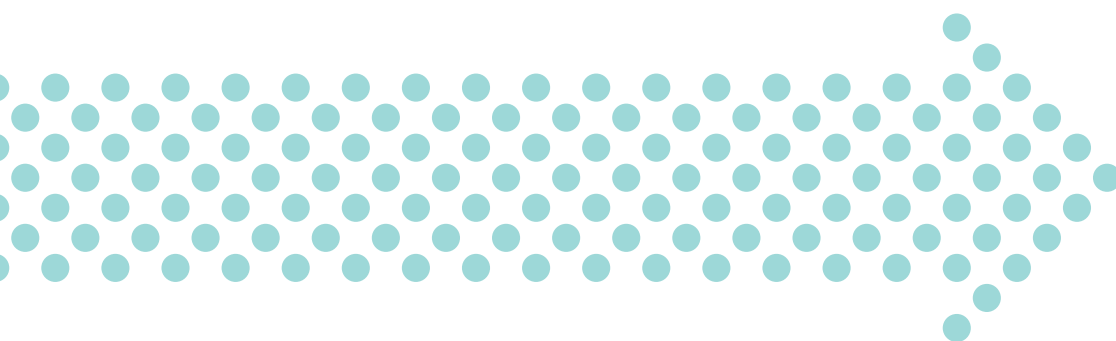


PARTNERING FOR A CLEANER FUTURE



INTRODUCTION

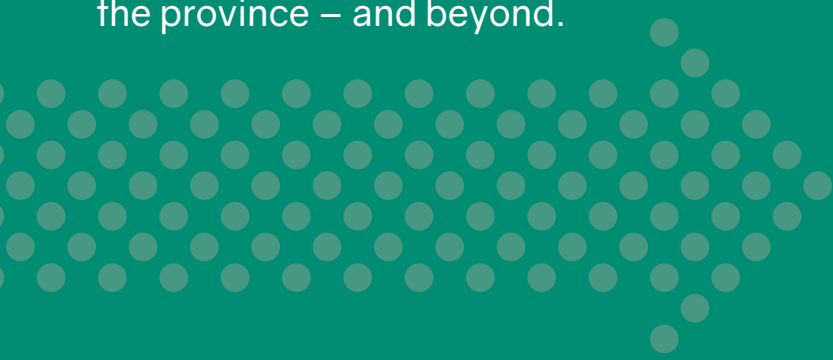
Protecting the environment is a key priority for Ontarians. In a survey conducted by universities, Ontarians expressed concern about the future. They worry about fresh water and clean air for their children and grandchildren, and about preserving the natural beauty of our province.

But they also know that climate change presents an economic opportunity.

They believe that focusing on technology and innovation will help Ontario move toward a clean economy while creating good jobs in local communities across the province.

Sustainability initiatives are one way that universities are collectively taking action and responding to the needs and priorities of Ontarians. By greening campuses through efficiency projects, educating students for the green workforce, or sharing knowledge and best practices both at home and abroad, they are instrumental in building healthier communities.

This 2018 report – the ninth annual – demonstrates how universities' environmental sustainability initiatives support students, communities, the province – and beyond.



STUDENTS



Ontario’s youth – including postsecondary students – are the true change agents. Through their creativity, leadership and motivation, they are shaping the behavioural change that is necessary for our society to adapt to a changing climate. Universities are supporting students’ passion and initiative, and helping provide them with the tools to continue driving change.

Universities are helping prepare students for a green workforce in the development of new and dynamic academic programs. Through growing interdisciplinary programs that filter a diverse set of subjects through the lens of sustainability, students are getting the education they need for the next generation of careers.

Students have opportunities to transform the theory learned in the lecture hall into hands-on work. This helps build students’ experience and gives them the transferable skills they need to thrive in the workforce and keep employers competitive. Together, students and their institutions are partnering to build strong, healthy communities and tackle issues facing the province.

● **Ryerson** students continue the university’s city building reputation at [TransForm Lab](#), a transportation and land use planning research lab. Research is driven by students who help identify how planning and policy can balance priorities of environmental sustainability, population health, livability, social equity and economic opportunity. TransForm Lab is developing young professionals with the knowledge and skills to help tackle policy topics such as mobility for an aging population, congestion management and technology-enabled transportation.



Ryerson TransForm Lab team



Lakehead
rain garden

● **Lakehead** received support from the Ministry of the Environment, Conservation and Parks' Great Lakes Guardian Community Fund to design and install a rain garden on the Thunder Bay campus. Students received hands-on education about stormwater management, site assessment and native plants, and applied this learning in designing and installing the rain garden. Projects like this cultivate leaders who can help protect Ontario's watersheds and help society adapt to a changing climate.

● Students at **Queen's** are gaining practical experience while also bettering local communities and the province. The Beaty Water Research Centre is dedicated to further understanding water governance, sustainability and protection of water resources. The 8,000 square feet of new lab space will bring together 44 graduate and 24 undergraduate students along with their research professors from the departments of civil and chemical engineering, chemistry, microbiology, genetics and public health. The new space will



uOttawa green roof

support the Centre's work on projects such as extracting safe drinking water from possibly untreated and unsafe water sources in rural and remote communities.

● Management students at **uOttawa** are getting hands-on experience on campus roof tops. Together with the Office of Campus Sustainability, the students researched the best use of empty roof space, determining that over their life cycle, green roofs are much more cost effective than conventional roofs. As a result, the university has engaged with students to study and create projects that will contribute to the university's ability to adapt to climate change.

● **McMaster's** Sustainable Future Program consists of four interdisciplinary courses that provide undergraduate students from all faculties with the opportunity for student-led, community-based and hands-on learning about sustainability. This program was initiated in 2013 with only 97 students and has since increased to over 600 students. Examples of on-campus completed projects include the McMaster Teaching & Community Garden and permeable paving projects for parking and campus bike racks.



Queen's Beaty Water Research Centre



University of Toronto Scarborough's GTA Invasive Species Awareness Day



● Students from the **University of Toronto Scarborough's** Masters of Environmental Science program organized the first-ever GTA Invasive Species Awareness Day. The students brought regional conservation practitioners, researchers and environmentally-focused organizations to campus to share knowledge about the invasive species that are wreaking havoc on Ontario's regional

ecosystems. While the issue of invasive species management is extremely complex, events like this empower citizens and professionals to collectively tackle the problem head on.

● Regensis at York is the **York University** chapter of Regensis, a student-run, university-based environmental and community-building organization. Their vision is to empower students as agents of change in addressing today's social and environmental concerns, focusing on real, practical solutions. They create on-campus environmental initiatives and programming including supporting local farmers, bike shares and a borrowing centre to prevent unnecessary consumption and waste.



Regensis at York University

COMMUNITIES



Local communities and businesses face many environmental challenges, including how to plan for extreme weather events to avoid economic disruption, how best to preserve parks and ecosystems, and how to employ technology that will improve the lives of residents. Partnerships are key to helping address these issues.

Universities partner with the people who live in our communities, including Indigenous Peoples, governments, local businesses and industry, and other organizations, to help address the sustainability issues affecting communities.

Supporting local business, for example, has both economic and environmental benefits. Buying local products, such as food, means lower emissions from transportation, and also lower fuel costs. By working together, and sharing knowledge and resources to proactively address climate change, we are helping our communities develop solutions that work for them.

● **The University of Ontario Institute of Technology** expanded its Pollinator Project to include a new community garden and greenhouse. These create a welcoming space for growing vegetables, herbs, and pollinator-friendly flowers, while building and supporting a stronger, well-connected community. The greenhouse allows the university to extend the growing season for produce on campus. To help provide more fresh fruits and vegetables to those in need in the local community, excess produce is donated to St. Vincent's Kitchen and Feed the Need Durham.



St. Vincent's Kitchen

● Carleton has established a local food project that allows the university to order directly from farmers and co-op partners in the region. The project was initiated through a grant from the Greenbelt Fund, an organization that promotes local agriculture and the Ontario Greenbelt. The pilot project allows, via an online portal, to see what is available in the field and ready to be picked. This creates business opportunities for small, independent local producers and makes fresh produce available for students.



Carleton goes local

● The Laneway Housing project is being developed by the **University of Toronto** within the Huron-Sussex neighbourhood of the **St. George** campus. This is part of a larger initiative to deliver affordable infill housing within walking distance of the campus. Two ultra-low-energy “passive house” prototypes will be constructed to develop design criteria for future homes. Building components are designed to achieve net-zero energy – energy consumption equal to the amount of renewable energy generated on the site – using photovoltaic solar energy, earth tubes and heat recovery ventilation.



St. George campus
Laneway Housing project



Brock-Lincoln partnership signing

● The Brock-Lincoln Living Lab (BL-LL) is a new partnership between **Brock University** and the Town of Lincoln. The BL-LL is meant to leverage the resources and capacities of both communities, while also engaging students in hands-on learning. Two Master of Sustainability students will create a needs assessment to identify priority areas of the Town of Lincoln for the next four years. It also supports crucial research looking at how communities can deal with the impacts of shoreline flooding.

● The City of Guelph launched an update to the city's Community Energy Plan in 2017. Dr. Kirby Calvert from the **University of Guelph** was elected Co-Chair, bringing his wealth of experience in community energy planning to the table. His expertise helped lead the City towards a Net-Zero Carbon by 2050 target for Guelph.

● **Laurentian's** Indigenous Medicinal Garden is a physical reminder of collective stewardship and responsibility for the earth. The Garden's placement at the northern door of the new Indigenous Sharing and Learning Centre represents the spiritual aspect of life and is a place of wisdom, reflection and sharing. The medicines are living traditional teachings that “other-than-human-beings” take care of us all, and connect the university community to the spiritual power of the land.



Laurentian's Indigenous Sharing and Learning Centre

THE PROVINCE – AND BEYOND



Industry is working to tackle the challenges of climate change through research and development – especially as clean technology is, and will be, critical to long-term environmental sustainability, and economic growth. Both at home and abroad, Ontario – and its universities and research institutes – is recognized as a global leader in helping deliver these solutions. University-industry partnerships are developing new, innovative solutions to issues of energy production, recycling, lighting and transportation.

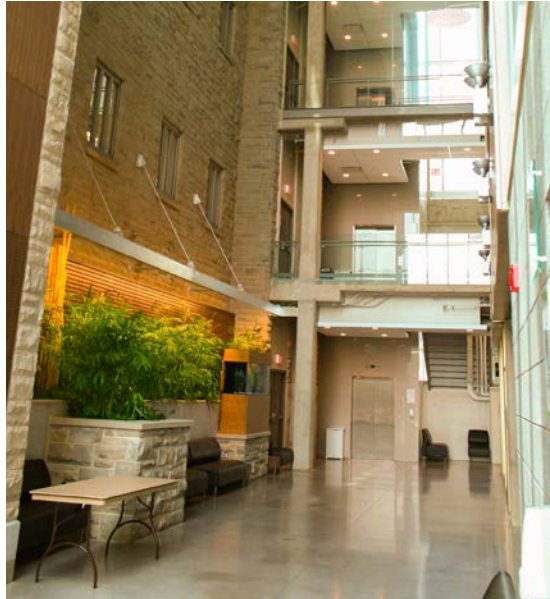
Reducing greenhouse gas emissions improves Ontario's air quality, making the province a cleaner place to live. On campuses, universities are reducing their own carbon footprint by undertaking significant emissions reductions projects. They are building new, low-carbon buildings and renovating aging buildings to improve their energy efficiency. Advances in these technologies help business and the province thrive.

Climate change has no borders, and neither does opportunity. With a national and international reach, our universities are sharing research on issues like sustainable agriculture and renewable energy. Joint programs with institutes and universities overseas are bridging knowledge and culture to share solutions in search of a cleaner planet.

● The CleanCube Project by OCADU professor Sarah Trantum is designed to provide an accessible, affordable source of clean water to those who need it most. Currently in the prototype stage, the CleanCube product is a dissolvable cube made of natural plant-based material that can be added to stored drinking water to kill 100 per cent of E. coli bacteria. This product is part of a larger system that includes small batch production, community-based education, alternative marketing and distribution strategies, and appropriate pricing that fit the realities of CleanCube's target users.



OCADU Clean Cubes



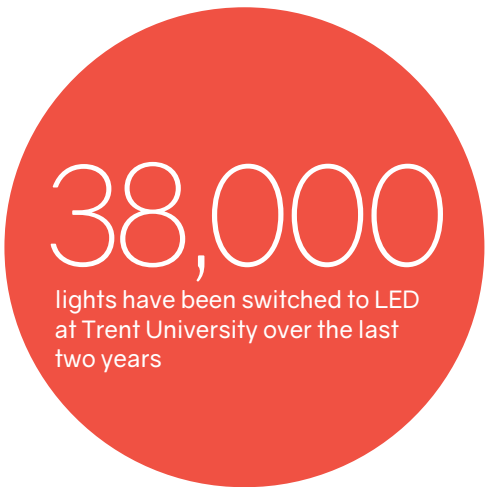
Sustainability features of Western's Lassonde Pavilion

● **Western**, in partnership with T-Innovation Partners and London Hydro, is developing artificial intelligence technology that will optimize energy use inside buildings. The system will actively learn how to self-adjust to various external factors to constantly improve energy efficiency and reduce carbon emissions. Self-adjustment can be as simple as turning lights on/off or as complex as adjusting the operating load of a generator in a power grid. This technology is being developed using data from the Claudette McKay Lassonde Pavilion building on Western's campus and could be commercialized and applied in buildings around the world.

● A collaborative research project at **Windsor** is starting to make waves. The Real-time Aquatic Ecosystem Observation Network (RAEON) is supporting comprehensive and multidisciplinary research to understand, manage and protect the Great Lakes. State-of-the-art resources, including a network of real-time sensors and autonomous sub-surface vehicles, will help make this cutting-edge research possible. This work will also help researchers worldwide who are investigating freshwater ecosystems.

● As unique ecosystems, cities present challenges as well as opportunities. The **University of Toronto Mississauga's Centre for Urban Environments'** mission is to provide global leadership on how to make cities healthier for humans and the environment. The Centre hopes to tackle such issues as resilience to environmental change, conservation of endangered species, preventing the effect of invasive species, supporting the health and well-being of citizens, ensuring access to urban green space, and educating and empowering the next generation.

● **Trent** is undergoing an ambitious energy retrofit project anticipated to significantly reduce greenhouse gas emissions and save money. Trent is converting 100 per cent of campus lighting to LED. They have changed more than 38,000 lights over the last two years, with completion expected in fall 2018. These changes are expected to save approximately 13 per cent of Trent's electricity use.



Trent's new LED lighting

● **Waterloo** launched the Sustainable Development Solutions Network (SDSN) Canadian chapter to mobilize Canada's expertise to accelerate problem solving for the UN's Agenda 2030 and the Sustainable Development Goals (SDGs). SDSN Canada will catalyze support for the SDGs across the country, promote practical solutions and long-term pathways for sustainable development, advance high-quality education and research collaboration, and support governments in understanding and addressing the challenges of sustainable development. Waterloo is a founding institution of the network, in partnership with the Waterloo Global Science Initiative.

● By exploring the psychology of sustainability, **Wilfrid Laurier** is maximizing the impact of green building design. High-performance green buildings work to lower emissions and energy use, but consistently fall short of their targets because the "people side" is not addressed: that is, how an individual interacts with the building's features to impact overall efficiency. The project, led by Associate Professor Manuel Riemer, will be based in evol1, a LEED Platinum and net-positive energy office building in Waterloo. The building will act as a living laboratory to better understand how to improve the sustainability habits of the building's occupants.



Students from around the world representing the 17 SDGs at Waterloo's SDSN launch



WLU Associate Professor Manuel Riemer at evol1, Canada's first Zero Carbon Building

CONCLUSION

Across the globe, business, industry, governments and local communities are focused on seizing the opportunities that can help drive economic opportunity while reducing emissions. With concrete actions, university partnerships – with students, local communities and the province – are providing real solutions to the issues facing the province and the people of Ontario.

Together, we will ensure that future generations can continue to enjoy the beauty of our province and the economic benefits of a better, cleaner future.





Prepared December 2018 by:
Council of Ontario Universities
180 Dundas Street West, Suite 1800
Toronto, ON M5G 1Z8

ISBN: 978-0-88799-546-0
COU No: 935
ISSN: 1920-7352 (online)



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