



COLLEGES | COLLÈGES  
ONTARIO | ONTARIO

# COLLEGES DRIVING A SUSTAINABLE FUTURE:

## NEW CAREERS FOR A CLEAN ECONOMY

October 2010



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# INTRODUCTION

ONTARIO COLLEGES ARE AT THE FOREFRONT OF THE GREEN ECONOMY and are integral to its success. Environmental sustainability, energy conservation and innovation are core values, informing the colleges' curriculum, driving the colleges' infrastructure and growth, producing partnerships with industry and creating graduates with cutting-edge skills for careers in the sustainable economy.

The public colleges are uniquely positioned to work within their communities, building regional partnerships with business, industry and environmental groups, and creating the framework for new and expanded pathways to green careers.

Climate change demands the creation of a sustainable future. Ontario colleges are leaders in the shift towards a culture of sustainability, which requires the rapid introduction and expansion of new green technologies and behaviours across Ontario – in classrooms, workplaces, facilities and homes throughout the province.



# COLLEGE GRADUATES: JOB-READY SKILLS FOR SUSTAINABLE ENERGY AND THE CLEAN ECONOMY

*“One partnership of which I am particularly proud is our award-winning partnership with a number of Ontario colleges. Our experience working with these colleges has been extremely positive and we commend them for the enthusiasm and dedication they have demonstrated to developing meaningful programs to launch the long and successful careers for our future workers.”*

– Laura Formusa, president and CEO, Hydro One

COLLEGES ARE DRIVING THE MOVE TO THE JOBS OF THE FUTURE. Entire new industries and new postsecondary skill sets will be required to support a sustainable economy.

The large majority of the affected occupations will be public college-educated: apprentices, technicians and technologists, technical sales forces, business and health sciences graduates.

Indeed, well-trained college graduates are essential for all aspects of the green economy – for the construction and maintenance of public and private infrastructure and as key employees in sectors such as transportation, water and waste treatment, energy supply, distribution and conservation, and manufacturing products.



To ensure students are at the forefront of green skills training, colleges have worked with employers to modify curriculum for existing occupations and develop curriculum for new occupations.

As a result, 35 new diploma or certificate programs related to the sustainable economy have come online in the past three years, including 14 new programs being introduced this fall. These programs include:

- **Green Architecture.**
- **Wind Turbine Technician.**
- **Green Business Management.**
- **Renewable Energies Technician.**
- **Sustainable Energy and Building Technician.**
- **Alternative Energy Engineering Technology.**
- **Ecosystems Survey.**
- **Water Distribution and Wastewater Collection.**
- **Geothermal Engineering Technician.**
- **Sustainable Winemaking.**

In addition, many other programs have green components in the curricula of individual courses. For example:

- The Academic Green Transect of **Seneca College** in Toronto is a process to support each distinct academic program of the college in recognizing and enhancing its environmental performance.
- **Cambrian College** in Sudbury offers its Global Warming Concepts online course to graphic design students and others through OntarioLearn. And its Chemical Engineering Technology Advanced Diploma curriculum covers topics related to water and waste water treatment.
- Graphic design students at Toronto's **George Brown College** complete a sustainable design project.



# COLLEGE PARTNERSHIPS WITH ECOLOGICAL INNOVATORS

*“The global trend towards fighting climate change and ensuring environmental sustainability presents enormous economic opportunities. The potential for growth in sectors such as clean energy, green transportation and energy efficiency is significant.”*

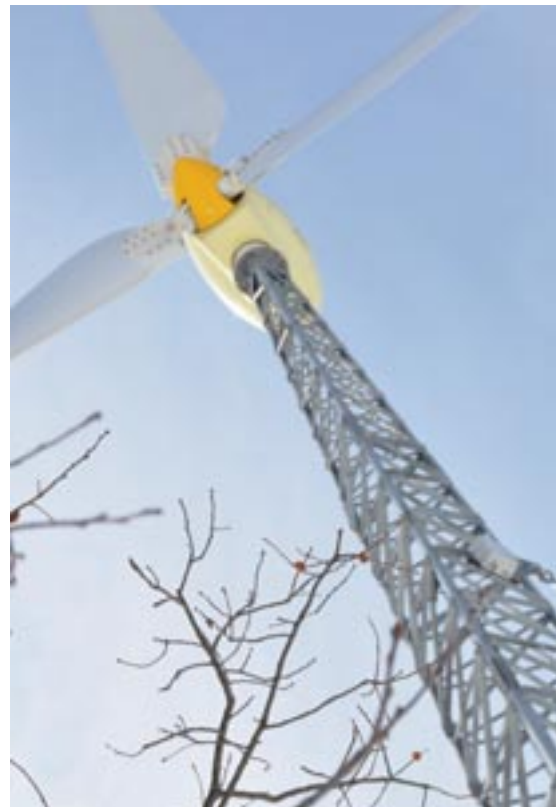
– 2010 Ontario Budget

COLLEGES HAVE AN EXCELLENT RECORD in supporting green innovators in sectors such as construction, renovation and management, energy supply, infrastructure development, transportation and instrumentation.

Their goal is to accelerate the green economy by helping Ontario companies find ‘made in Ontario’ solutions to their green challenges – from energy management to waste and toxins reduction to green packaging, and by addressing the many specialized barriers to growth facing green entrepreneurs – technology, marketing, skills, regulation.

Partnerships include:

- **Canadore College** in North Bay developed an energy audit and conservation program in conjunction with North Bay Hydro.
- **Centennial College** in Toronto worked with Toronto Hydro to create its energy action management plan.
- **Durham College** in Oshawa has a research agreement with GreenWorks Solar Power, a solar tracking system manufacturer based in Brighton. Durham College’s collaboration with GreenWorks will concentrate on the development of a new ground-mounted solar tracking system.



- With funding from Bioniche Life Sciences, Whitmire Micro-Gen, Makivik Corp. and the Ontario Innovation Trust, **Loyalist College** in Belleville constructed a Supercritical CO<sub>2</sub> Extraction Laboratory, one of the most advanced fractionating four litre extractors in North America.
- The Porous Pavement Project, part of Built Environment Research at **Seneca College** in Toronto, is a partnership with the Toronto Region Conservation Authority, Environment Canada, Oak Ridges Moraine Foundation and Walmart Canada. The project analyzes the on-site water distributing capacity of the porous pavement treatment of a parking lot alongside a traditional non-porous pavement parking lot.
- Hydro One's partnership with **Northern College** in Timmins, **Algonquin College** in Ottawa, **Georgian College** in Barrie and **Mohawk College** in Hamilton attracts and educates the future employees of the electricity transmission and distribution utilities sector.
- **Durham College** is developing an incubation centre designed to provide new energy industry partners with space and access to faculty expertise and campus equipment to help new energy inventors and innovators bring their ideas from concept to prototype.
- **Conestoga College** in Kitchener has been approved for an Ontario Centres of Excellence Interact project with the Canada Masonry Design Centre to design and undertake a study assessing the impact of Green Building Certification programs on the masonry contractor industry.
- The Centre for Advanced Manufacturing and Design Technologies at **Sheridan College** in Oakville has partnered with the Building Owners and Managers Association to deliver energy conservation opportunity scoping analyses and reports for commercial and industrial customers in the 416 area code. The centre provides a practical platform to efficiently deliver competitive sustainable technology, employment opportunities and a pipeline of highly trained graduates.

# ENVIRONMENTAL LEADERSHIP IN THE COMMUNITY

ONTARIO'S PUBLIC COLLEGES ACT AS CATALYSTS in their communities to build understanding about the local opportunities inherent in moving to a sustainable economy.

The colleges work with their communities to find those opportunities and turn them into realities. In the process, students gain green skills, which they can later translate into jobs in the green economy.

- In a pilot project at **St. Lawrence College** in Kingston, students of the Energy Systems Engineering Technician Program conducted a deep energy audit at older elementary schools in partnership with the Limestone District School Board.
- PowerStream has donated \$750,000 to **Georgian College** to provide additional resources for students, upgrade the skills of people in the workforce, and help to offset a future skills shortage in the utilities sector.
- The Suncor Sustainability Centre/Bluewater Sustainability Initiative is a collaborative effort of Sarnia's **Lambton College** and Suncor Energy Foundation to promote sustainable development in Sarnia-Lambton through innovation and education.





- **Confederation College** in Thunder Bay held a Green North Eco-Conference for international sustainability experts.
- **Collège Boréal** in Sudbury, funded by the Rural Secretariat, PICLO and FedNor, is researching the role of colleges in creating “knowledge clusters” that assist in transforming communities from total dependence on the commodity-based forest economy to one which includes all value-added uses of the forest.
- Since 1995, **Collège Boréal** has distributed 700,000 tree seedlings cultivated in the college’s greenhouse.
- **Cambrian College** has hosted the Living Building Conference & Trade Show.
- The World House Project at **George Brown College** in Toronto is a sustainable house and housing system that achieves a balance between extremes of urban sprawl and urban slums and enables people to build sustainable, universal, and healthy human dwellings and communities.
- **Canadore College** is collaborating with Nipissing First Nations to investigate micro-hydro potential for power generation on Duchesnay Creek.
- **Niagara College’s** Niagara Environmental Corps builds environmental awareness among students, faculty and staff, creates partnerships with local environmental organizations for applied research initiatives and co-op opportunities, and builds relationships with local high schools to promote environmental education.
- **Seneca College’s** Green Business Management graduate certificate program focuses on helping students define what it means for a company to be green. Graduates develop and implement sustainability action plans, and communicate those plans to educate and inspire colleagues and customers.

# COLLEGES SHOWCASING SUSTAINABLE FACILITIES AND EQUIPMENT

COLLEGES HAVE TAKEN A LEADERSHIP ROLE in Ontario's public sector with a goal of reducing the college system green footprint.

By initiating green projects on campus, colleges can act as a showcase for Ontario green businesses and become test beds for new environmental technology, products and services. In so doing, they provide on-site examples for students who take their new skills into the workforce.

In 2006, Ontario's colleges became the first public-sector system in the province to launch an energy secretariat, designating the Power Applications Group Inc. to act in that capacity and provide shared, cost-effective expertise for the system in energy conservation.

There are a broad array of green facilities and equipment on our colleges' campuses.

- **Northern College** has installed a plant-based roof system above its new Centre of Excellence for Trades and Technology at the Porcupine Campus.
- **Lambton College** is currently constructing a \$1.1-million smart house, which will showcase the latest innovations in energy efficiency. Part laboratory and part classroom, its house will also be open to the public.
- Energy House at **St. Lawrence College** consists of a matched pair of buildings that are an integral part of the Energy Systems Engineering Technician/Technologist Program at the college, as well as being a public and local school board education centre for alternative and renewable energy technologies.



- The Real-time Operating System™ being implemented by Ontario colleges is an advanced energy management initiative to better maintain aggregated energy purchases (currently electricity, but future initiatives may include gas and water), operated by the Ontario colleges as a group. There is capacity to connect to metering equipment to provide users with real-time energy data including real-time energy costs, energy analytical tools, automatic reporting, energy cost allocation, and energy budgeting.
- A 2,900-square-foot green roof, with a lifespan of 65 to 100 years, was recently installed at **Lambton College**. Featuring moss from the Gobi Desert, it is the first of its kind in Canada. Aside from an initial watering, the moss does not require any additional attention as it is able to survive extreme temperatures and drought. Within four years, it will have an insulation value of R-40, well beyond conventional standards in Canada. Locally, Imperial Roofing was contracted to train its employees on the technology and do the actual installation.
- Proposed on the northwest side of **Lambton College** is a smart house that will feature the latest energy efficient technologies such as geothermal heating, solar panels, moss roof, Velix skylight with an electronic shade, and an interior thermal brick wall. The \$1.2-million smart house will be a working lab for various college programs.
- **Fleming College** in Peterborough features a Centre for Alternative Waste Water Treatment, a research facility that promotes constructed wetlands and other innovative forms of waste water treatment.
- **Algonquin College** has established a partnership with the Town of Perth to enable students to develop expertise in the area of green construction of smart homes as part of a two-year Advanced Housing program. The smart homes will subsequently form the core of a complete housing community.

- **Algonquin College** is building the Environmental Demonstration Centre for Construction Trades and Building Sciences.
- **Fanshawe College** in London recently installed its first green roof. Hundreds of sedum – a drought-resistant perennial ground cover - now occupy more than 850 square feet of rooftop space.
- **Humber College** in Toronto replaced the existing Nature Centre of Humber Arboretum Centre with a new LEED gold standard, Urban Ecology venue for education and research on urban ecology.
- Ottawa's **La Cité collégiale** has a new Research and Training Centre in the Construction Trades. Designed as a cutting edge example of environmental sustainability, the new centre is designed to be LEED silver minimum standard with solar heating, reuse of rain water for washroom facilities, and minimum parking spaces.
- **Niagara College** has undertaken a campus eco-system restoration that includes the Wetland Ridge Trail, linkage to the Bruce Trail, snapping turtle habitat and lagoon trails.
- **Sault College** has a wind turbine on campus providing an alternative fuel source and serving as a teaching tool.



# MOVING AHEAD

***“We must act quickly. We do not want to look back five years from now and say that other countries have developed the solutions the world needs and we have not.”***

*– Ellen McGregor, CEO of Fielding Chemical Technologies,  
a leading recycling firm based in Mississauga*

THE TRANSFORMATION OF OUR ECONOMY is essential and is underway. An economic growth strategy must include support for green skills. Traditional manufacturing is being replaced with an innovative green economy, creating new green jobs, industries and unlimited opportunities.

Ontario’s 24 public colleges are at the forefront of the movement towards a sustainable economy. Colleges are ever-evolving to meet the needs of their communities, industries and the labour market.

The emerging green economy has presented an enormous opportunity for colleges to showcase their ability to work with industry, focus on applied research to get products to market, and produce graduates who will be leaders in the sustainable economy. Colleges are essential to the creation of products and technologies, green-skilled graduates, partnerships and community development required to support and sustain this emerging economy.

The results thus far are remarkable for their scope, innovation and marketability. Ontario’s colleges are committed to capitalizing on these successes and moving forward to even greater ones.



ALGONQUIN COLLEGE

COLLÈGE BORÉAL

CAMBRIAN COLLEGE

CANADORE COLLEGE

CENTENNIAL COLLEGE

CONESTOGA COLLEGE INSTITUTE OF TECHNOLOGY AND ADVANCED LEARNING

CONFEDERATION COLLEGE

DURHAM COLLEGE

FANSHAWE COLLEGE

FLEMING COLLEGE

GEORGE BROWN COLLEGE

GEORGIAN COLLEGE

HUMBER COLLEGE INSTITUTE OF TECHNOLOGY AND ADVANCED LEARNING

LA CITÉ COLLÉGIALE

LAMBTON COLLEGE

LOYALIST COLLEGE

MOHAWK COLLEGE

NIAGARA COLLEGE

NORTHERN COLLEGE

ST. CLAIR COLLEGE

ST. LAWRENCE COLLEGE

SAULT COLLEGE

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