

Innovators. Entrepreneurs. Economic drivers.

These are Ontario's

Engineers

Every year, National Engineering Month has a theme. And this year's is a special one – engineering, innovation, entrepreneurship – designed to alert Canadians to the fact that engineers are about more than bridges and blueprints.

In fact, the engineering sector is at the forefront of economic growth and prosperity, and today's engineers are innovators and entrepreneurs.

As Ontario shifts away from its reliance on heavy manufacturing towards a knowledge-based economy, engineering innovation will be pivotal to its future.

"Engineers make good business people," says Rob Hughes, senior project manager with Stantec Consulting Ltd. and chair of the National Engineering Week Ontario Steering Committee. "This year's theme is all about promoting an understanding that engineers have a strong presence in the business world; that they are innovative and develop ideas that contribute to the overall betterment of not only their own personal success, but also the overall economy."

He says, as natural problem solvers, engineers are the ideal candidates for moving the economy forward. "The spin-off innovation that comes with that problem-solving ability is what drives and expands the economy."

With sectors such as green energy, computing technologies and environmental engineering currently emerging as the foundation of Ontario's economic future, engineers will play a significant role in all three, says Mr. Hughes.

"The nature of the engineer is to ask, 'How can we do it better?'" says Patrick Lamarre, executive vice-president of power at SNC-Lavalin, "How can we create the next generation of products that are to be rolled out?"

At SNC-Lavalin, engineers are working on cutting-edge environmental solutions.

Working in conjunction with Plasco Energy Group – which has created a plasma technology to convert waste into energy – SNC-Lavalin is helping transition the pilot project into a full-scale

productivity plant.

As well, SNC-Lavalin is working with SaskPower on the first commercial unit to capture CO₂ from a coal plant.

"It is important for government to work with research and development programs and private-sector companies to get next-generation, first-of-its-kind technologies out the door," says Mr. Lamarre. "That is how Canada will grow as a leading engineering economy. If we don't do it, other countries will."

Jonathan Hack, manager of strategic technology engineering, university and government relations at Bombardier Aerospace, says, to remain globally competitive, engineering innovation is one of the skill sets that makes Bombardier a leader in the industry. And it is partnerships such as the Consortia for Research and Innovation in

Aerospace in Quebec that assist in bringing new technologies to market.

"By working together, and working with government, we are able to take emerging technologies that are not yet proven and put them into test programs and flight demonstrators to validate the technology and get it to market," says Mr. Hack.

Universities play a large role in such partnerships.

James Andrew Smith, an assistant professor of Electrical and Computer Engineering at Ryerson University says two big engineering-faculty developments of late are helping push advanced technologies into use. First, Ryerson's Centre for Urban Energy is focused on the need for inexpensive, reliable and clean energy.

As well, Ryerson's professors in the Biomedical Engineering

undergrad program – Canada's first stand-alone undergraduate program in this field – are already producing some market-ready innovations.

For example, Dr. Victor Yang, who heads the Biophotonics and Bioengineering Laboratory at Ryerson, is involved in several next-generation medical imaging innovations. He is working with Hologic and Tornado Medical Systems to develop an innovative optical guidance system for the accurate placement of biopsy needles in breast and prostate cancer diagnosis.

Rod McNaughton, director of the Conrad Centre for Business, Entrepreneurship and Technology at the University of Waterloo, says, "Engineers are behind the innovations that drive economic prosperity by helping industry to be more productive and use resources more efficiently."



National Engineering Month (NEM) is a nationwide celebration of engineering and technology.

This year marks the 19th annual National Engineering Month. Volunteers in each province and territory will host events and activities designed to increase public awareness of engineering and engineering technology and encourage young people to consider careers in these fields.

National Engineering Month will be celebrated in Ontario from Saturday, February 26 to Sunday, March 6. Volunteer organizers from across Ontario are hosting activities ranging from bridge-building, egg-tossing and robotics competitions to sustainability challenges and engineering design demonstrations. **See NEWOSC 3 for details on events in your area.**

online? Visit www.engineeringmonth.on.ca for more information.



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LEADING-EDGE PROGRAMS/COLLABORATIONS

Commercialization partnerships give engineering students opportunities for cutting-edge research

Electric cars, wind- and solar-power generation, a six-degree-of-motion flight simulator – these are just some of the cutting-edge research projects being undertaken on campus by Ontario engineering students.

"We want students to innovate and push the engineering envelope," says Dr. Metin Yaras, chair of mechanical and aerospace engineering at Carleton University.

Fourth-year students at Carleton work in multifunctional engineering teams on projects

that include developing a gas turbine-based power-generation facility that utilizes supercritical carbon dioxide, a patient simulator for teaching medicine and an open-wheeled race car based on hybrid propulsion.

The projects are designed so students learn more than just existing technologies. "We're challenging them to take things forward," Dr. Yaras says.

Two years ago, for example, Carleton students built a prototype unmanned aerial vehicle

(UAV) with a 16-foot wingspan constructed of carbon composites. The UAV, designed for geological surveying, is now being prepared for its first flight – an important first step towards commercialization.

"By engaging in projects with real-world applicability, students experience engineering in action," says University of Windsor president Dr. Alan Wildeman.

Windsor students and faculty are researching ways to make alternative energy sources, such

as wind and solar, efficient and cost-effective. They are also working with the automotive industry on many projects including the electrification of drive trains and improving child-safety features.

This spring, UWind-son will open the "Industrial Courtyard" section of its new 300,000-square-foot Centre for Engineering Innovation (CEI). The Courtyard will allow companies to engage students and faculty in real-life engineering research projects.

"We're completing the innovation pipeline by linking education, research and industry," Dr. Wildeman explains.

When completed in 2012, the CEI building itself will be a living lab. For example, through sensors built into pedestrian bridges, students can learn about load distributions and strain. Other sensors will allow students to monitor efficiency of the building's heating, ventilation and air-conditioning system and learn about concepts such as heat transfer.

National Engineering Month in Ontario: Celebrating from February 26 - March 6, 2011

See the Ontario Event Calendar at www.engineeringmonth.on.ca

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