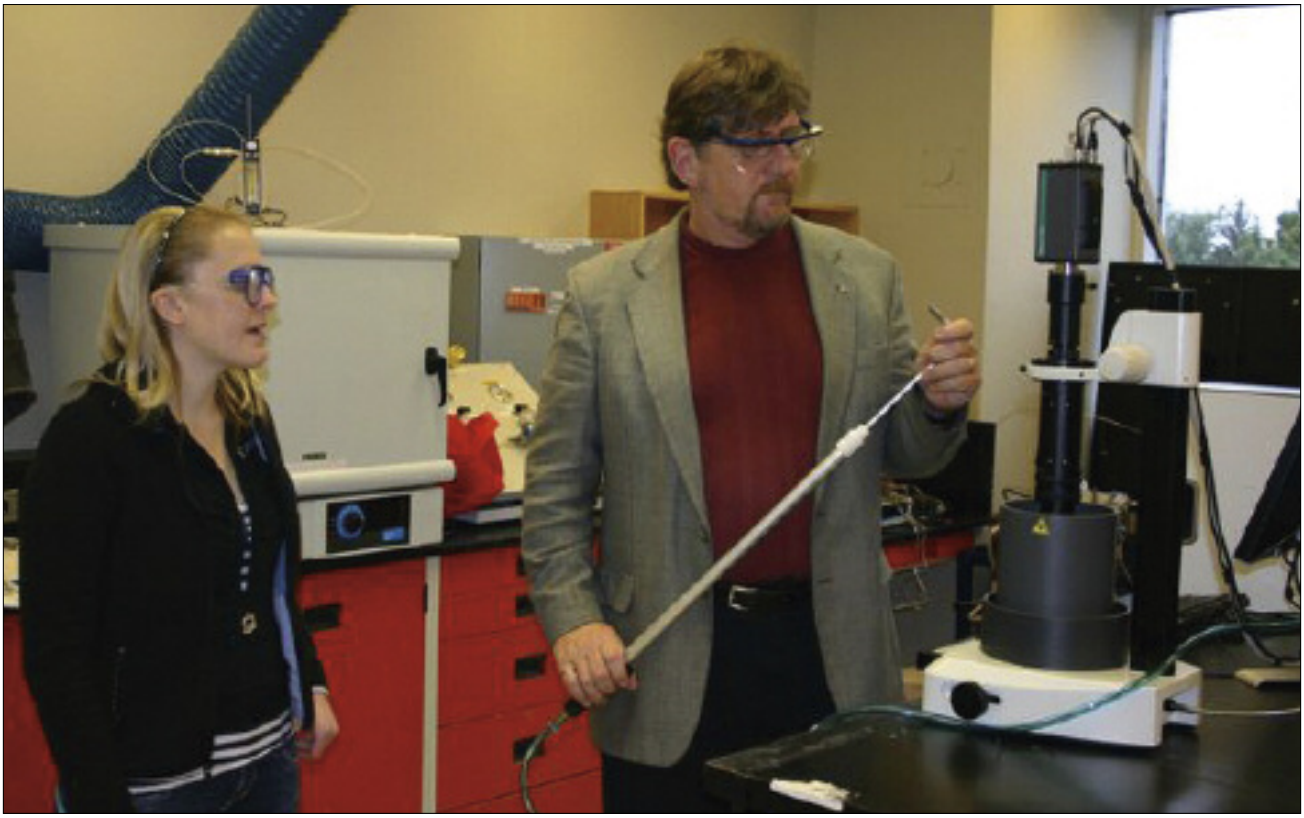
Ideas on the Edge



Beyond Cars

FUEL CELLS WERE SUPPOSED TO BE ABOUT AUTOMOBILES, RIGHT? BUT RESEARCH BY DR. BRANT PEPPLEY AT THE ROYAL MILITARY COLLEGE IS PUSHING THE TECHNOLOGY IN NEW DIRECTIONS.

"We've got to get over this auto thing," says Dr. Brant Peppley, Director of the Fuel Cell Research Centre in Kingston.

"People always say, 'Hey, I thought we were going to have fuel cells cars by now. Where are they?"

The truth, Dr. Peppley points out, is that commercial fuel cells are increasingly at work all around us. They're powering a new generation of specialty vehicles like fork-lift trucks, and replacing diesel generators as a source of back-up power.

But that's just the beginning. Dr. Peppley predicts that within ten years, fuel cells will also begin to play a major role in providing residential power. The technology would work especially well as part of a de-centralized, renewable energy strategy. Solar cells on the roof of a house, for example, could provide the energy to create hydrogen fuel from water during the day; then at night, a fuel cell would turn the hydrogen back into electricity. As a bonus, thermal energy produced by the cell would help with heating.

"The biggest barrier is cost," says Dr. Peppley, "and cost is driven very much by the price of platinum catalyst." Fuel cells require a catalyst to support

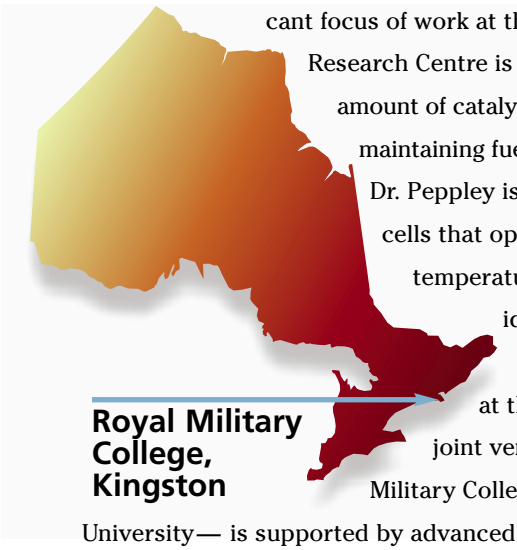
RESEARCH THAT MATTERS

REAL-WORLD BENEFITS FOR ONTARIANS:

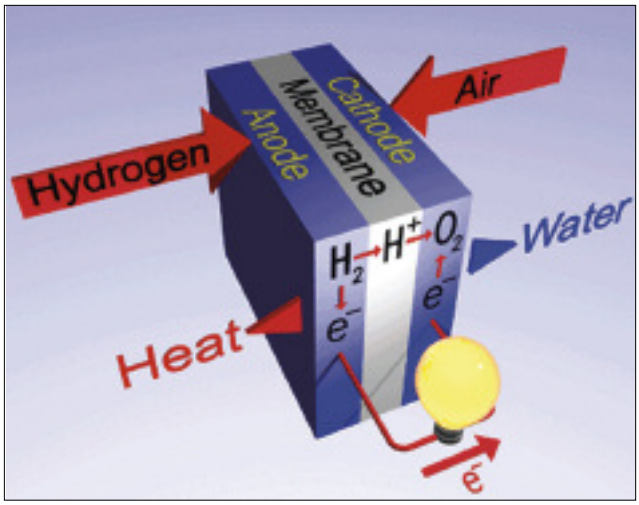
- a clean energy option with a variety of applications
- potential for world leadership in the emerging renewable energy sector

Project: Fuel Cell Research and Innovation Centre
Institution: Royal Military College
Research Sector: Engineering
Principal Investigator: Brant Peppley
Trust Investment: $1,169,712
CFI Investment: $1,697,449
ORF Investment: $527,737
Total research investment from all sources: $4,243,624

the chemical reaction that produces electricity. A significant focus of work at the Fuel Cell Research Centre is on reducing the amount of catalyst needed, while maintaining fuel cell reliability. Dr. Peppley is also working on cells that operate at lower temperatures—a more residential-friendly 160ºC. Research at the Centre—a joint venture of Royal Military College and Queen's University— is supported by advanced lab facilities funded in part by an investment from the Ontario Innovation Trust.



Caption?



Fuel cells work something like batteries, producing electricity through a chemical reaction. But unlike batteries, fuel cells are continually replenished with the reactant substances, the most common of which are hydrogen and oxygen. A third substance—the "catalyst"—is contained in the cell's central membrane, and supports the reaction. Water and heat are the only by-products of a hydrogen fuel cell.

And what about the fuel cell automobile? Dr. Peppley still believes it's going to happen. But he has another interesting idea about the connection between fuel cells and cars.

"As far as I can tell, the North American automotive industry isn't exactly growing. And yet we have this incredible infrastructure in Ontario. Fuel cells would offer the perfect opportunity to take advantage of that by converting the industry's manufacturing capacity to a clean energy option. We might not be making fuel cell automobiles, it might be fuel cell power systems. But we could provide the world with that technology."

Ontario Innovation Trust

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Infrastructure for Innovation
About the Ontario Innovation Trust

The Ontario Innovation Trust was created in 1999 by the Government of Ontario to invest in research equipment and facilities at Ontario's universities, colleges, hospitals and other non-profit research institutions. The Trust is governed by a volunteer Board of Directors, according to the terms of a Trust agreement established by the Ontario government. A small permanent staff looks after day-to-day operations.

Since its inception, the Trust has committed almost $843 million to strengthen Ontario's position in the global marketplace of ideas. This represents more than a third of the $2.44 billion in total funding that has been invested in Trust-supported projects.