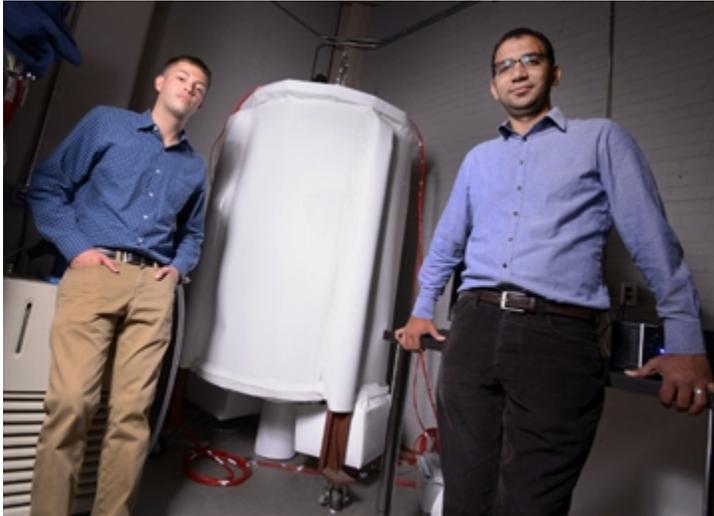


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Mac partnership close to solving alternate energy puzzle



GEOHERMAL

Barry Gray, The Hamilton Spectator

Jake Windsor, left, and Hazem Mazhar with a prototype of a hybrid geothermal system.

By [Steve Arnold](#)

A new Hamilton company is on the verge of solving one of the biggest problems in the drive to use heat from the earth as a new form of energy.

The company, Capture Technologies Corp., is being formed out of a joint project between a Toronto-based engineering firm and McMaster University.

Jake Windsor, the company's 24-year-old chief executive officer, said efforts to use geothermal energy to reduce the use of fossil fuels to drive heating and ventilation equipment have always been hampered by the fact the quality of energy taken from the earth deteriorates with time.

Capture's contribution is a way of using solar energy to recharge what's taken from the earth.

"This alternative energy industry has been damaged in the past because the heat taken from the earth doesn't hold the same temperature and has to be reheated," he explains. "The energy you need to do that makes the whole process expensive."

Efforts to reduce the use of fossil fuels with solar energy to reheat what's taken from the ground have foundered in the past because of physical limitations and heavy maintenance costs.

Capture will replace solar energy systems that rely on heated liquid with a photovoltaic system that uses semiconductors to convert the sun's rays into direct current electricity to be used to recharge the energy from the ground.

The matchmaker for that marriage is Toronto-based engineer Ladislav Rak, of the firm McClymont and Rak. He sketched out the basic idea and then went looking for a research partner to help prove the technology.

"We first met with people at the University of Toronto," Windsor explained. "That just resulted in a lot of lunches."

Then they connected with McMaster's faculty of engineering and Dean Mo Elbestawi.

"Once we got to Hamilton we were just astounded at the help we received," he said. "That's why we're going to launch a new company that will be born and raised in Hamilton."

Leading the effort to prove Rak's idea is McMaster post-doctoral fellow Hazem Mazhar, Capture's chief technology officer.

To prove the solar-geothermal team can work, he has sunk a 200-metre deep bore hold beside a school in Caledon. From there he taps the heat of the Earth's core, warms it up with solar energy and then pumps it into the building.

"This requires a radical design change in alternative energy systems," he explained. "Right now the use of geothermal energy in Canada is almost nothing, but we're going to change that."

Early tests on the demonstration site in Caledon look promising, Mazhar said. A second live demonstration system will be installed in McMaster's new experiential learning ExCEL building. As with many new technical advances, Windsor said early adopters of the technology will pay a premium for using it, but that will change with time.

"Right now the photovoltaic system is a little pricey, but that's going to change," Windsor said. "We're the first company in Canada to try to marry solar photovoltaic and geothermal energy."

The new company's goal, he said, is for an initial 10 year payback on the system.

Developing Capture's business has so far absorbed about \$500,000 and Windsor estimates another \$1.1 million will be needed to get a workable system on the market. To raise that the company is looking to government alternative energy programs and angel investors.

As a return for the welcome they received from Hamilton Windsor said the plan is to buy as much of the new system's pieces and parts locally as possible, all part of the city's effort to switch from a manufacturing centre to a clean energy hub.

"We have made more progress towards our development here in Hamilton than we ever made back in Toronto," Windsor added. "Not only has this city fostered our development, the city has welcomed and supported us through this entire process."

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