

# School energy audits find millions in potential energy savings

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A two-year energy audit of Hamilton schools has identified energy conservation measures that could reduce their energy costs by almost \$2.4 million annually. The audit was conducted by engineering faculty and students at McMaster University.

The measures, presented today to officials from the Hamilton-Wentworth District School Board and the Hamilton-Wentworth Catholic District School Board, range from recaulking windows, adding insulation and using more efficient lighting to new investments in advanced heat recovery systems and boilers, and solar and wind generating systems.

"We found that the school boards are already involved in implementing many of the more achievable energy conservation measures at their schools," said Samir Chidiac, professor of civil engineering at McMaster and one of the lead organizers of the audit. "But they need support and decision tools to install technologies that will generate the greatest savings over the long term."

The energy audit, which was sponsored by Union Gas, was conducted by seven mechanical and civil engineering students working on co-op terms, supervised by two McMaster research engineers.

"Through the Union Gas EnerSmart program, we help our business customers make smart investments in energy-efficient equipment and technologies," said Mel Ydreos, vice-president of marketing and customer care at Union Gas. "The McMaster students and their advisors

have clearly demonstrated investment opportunities for Hamilton schools to significantly reduce energy costs while also reducing their [environmental footprint](#)."

The students first classified all the schools into groups with similar characteristics referred to as archetypes. The criteria for establishing archetypes included the school size, operation, building envelope, electrical, heating, cooling and [ventilation system](#) properties. The students then visited a subset of the schools representing the various archetypes to conduct full energy audits. The findings for each school were applied to the rest of the schools in their archetype to calculate savings potential. The use of archotyping reduced the time that would normally be required to fully audit all schools by six years.

"This archetype system can very easily be applied to any [school](#) system in a similar climate zone to calculate energy savings potential," said Jim Cotton, associate professor of mechanical engineering, McMaster University. "The opportunities for reduced energy consumption and cost saving are tremendous."

If all the audit's recommendations were implemented in Hamilton-Wentworth's schools, natural gas consumption could be reduced by more than 5 million cubic meters, or enough to heat more than 2,140 homes, and electrical consumption would be reduced by almost 2.8 million kWh.

"We are very appreciative of the work done by McMaster," said Tim Simmons, Vice-Chair of the HWDSB Board of Trustees. "It is not something we could have done on our own. The findings reaffirm that our current programs are moving in the right direction. It will also help us assess opportunities for energy savings requiring larger investments for both existing schools and schools that will be built in future."

"This initiative builds upon our system's commitment to the efficient use of all resources and good stewardship practices," said HWCDSB Chairperson Patrick J. Daly. "We are looking forward to further developing our relationship with McMaster in assessing energy reduction programs, particularly where students can be involved. We have found that energy consumption in our schools decreases when students are actively engaged in helping to save energy."

The engineering students have also given talks to science and physics classes regarding their work. One high-school student also became involved in the energy audit.

"One of the greatest benefits of this program is the hands-on experience gained by our [students](#)," said David Wilkinson, dean, Faculty of Engineering at McMaster. "They are the ones who will be designing our schools and energy systems in the future so this work is invaluable for them and for all of us."

Provided by McMaster University

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