

The background of the top section is a photograph of the Durham College building, a modern structure with brick and glass facades. A large green lawn is in the foreground, and some trees are visible. A white box in the top left corner contains the Siemens logo and tagline.

SIEMENS

Ingenuity for life

Durham College

Siemens helps Ontario institution seize opportunity to expand its leadership in sustainability.

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Located on the eastern edge of the greater Toronto region, Durham College is extending its long history of environmental responsibility by building a new geothermal system. This eco-friendly project, which leverages underground thermal energy for heating and cooling, is helping this institution named as one of Canada's greenest employers reduce its emissions even further. It's a fortuitous project, one that came about through a combination of ambitious thinking, good timing, and a trusted partnership.

Customer Objectives

In 2017, Durham College took note of an exciting opportunity to seek funding for a major sustainability project. The government's Greenhouse Gas Campus Retrofits Program was seeking applications from colleges and universities throughout Ontario. But the opportunity came with a challenge – once awarded the funding, the project needed to be completed within a short time window of just 12 months.

For Durham College, the funding opportunity was too great to pass up because a new eco-friendly project could help extend its proven tradition of sustainability while generating operational savings. However, the college's facilities management team was working at capacity and concerned about meeting timelines for such a large-scale project.

Durham College turned to Siemens, with whom it shared a 20-plus-year partnership, to help with its bid. "They really helped take the lead on the application," says Doug Crossman, Durham College's Director of Facilities Management. "We worked with them to identify a project that could make a significant carbon reduction impact and they took it and ran with it, completing the analysis, documentation, and calculations."

"Our long history with Siemens was a significant factor in this project's success. Their understanding of our systems and how this project would work on our campus really added to the trust factor."

Doug Crossman
Director of Facilities Management
Durham College

The new geothermal field is projected to reduce GHG emissions by 64% at the college's largest building.

Siemens Solutions

Durham College's successful bid was for construction of the new Simcoe Geothermal Field. Implemented by the Siemens Energy Performance Services team, the installation uses clean, sustainable geothermal energy to heat and cool the 265,000-square-foot Gordon Willey Building, Durham's largest facility and a hub of student activity on campus.

Geothermal exchange uses underground thermal energy storage to deliver seasonal heating and cooling. This type of project was particularly well-suited for Durham College due to a number of factors:

- The college was experienced with the technology from a smaller geothermal field at its satellite campus
- The recent demolition of an almost 50-year-old building provided the needed green space for a geothermal field
- Geothermal offered an effective way to meet Durham's aggressive goals to reduce GHG emissions

The last point was a deciding factor for Durham College and Siemens. For heating requirements in the winter and parts of the shoulder seasons, the college primarily uses natural gas, a fuel source with relatively low emissions. To drive down emissions further required switching to a more efficient fuel. While clean, coal-free electricity is available in Ontario, switching from gas to electric boilers would prove to be costly to operate.

Siemens led the team that constructed the geothermal ground source heat pump system. The massive 6,086-square-meter field is comprised of 150 boreholes, each 180 meters deep, fitted with pipes carrying a water/glycol mixture that is cooled by underground temperatures in the summer and warmed in the winter. The pipes lead to heat pumps that further raise or lower temperatures needed to heat or cool the building.

Durham College's facilities team manages the installation using the Desigo CC control platform from Siemens along with Siemens Navigator for energy analysis and reporting.

Customer Results

Construction of the Simcoe Geothermal Field was completed on schedule. In order to meet the tight timeline, construction took place through the winter. "Our long history with Siemens was a significant factor in this project's success," adds Mr. Crossman. "Their understanding of our systems and how this project would work on our campus really added to the trust factor."

With commissioning complete, the underground piping network disperses heat in warm months and then harvests it during cool months – all underneath an open, green space in the center of campus. Using this new system, the college is projected to reduce the Willey Building's GHG emissions by 64 percent.

The new geothermal field also contributes to Durham College's academic mission. Next to it is the Energy Innovation Centre (EIC), a living laboratory that was part of the original plan for this project. The EIC features a viewing gallery and touchscreen monitors, including an energy dashboard, designed to engage students in understanding the geothermal field and other sustainability-related topics and technologies. Elements of the Energy Innovation Centre will be integrated into curriculum and research as a means of enhancing program delivery, contributing to student success, and leading to careers that are making a difference in the world.



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