SIEMENS
Ingenuity for life

DURHAM COLLEGE
SUCCESS MATTERS

Authors/Presenters:
Doug Crossman, Director, Facilities & Ancillary Services; Sarah Dehler, Communications and Sustainability Specialist, Siemens; and Fred James, Director, Higher Education, Siemens

Durham College Geothermal Energy Storage Project

Leveraging Geothermal Energy to Reduce GHG Emissions and Connect with Students

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 leverages underground thermal energy for heating and cooling and is helping this institution, named as one of Canada's greenest employers, reduce its emissions even further. It's a project that came about through a combination of ambitious thinking, good timing, and a trusted partnership with Siemens.

A 12-Month Completion Timeframe

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.

Building Blocks of a Successful Project

Maximize Your Connection to Academics: Living Lab
- Durham College took the approach to maximize the Oshawa Campus geothermal project with academic engagement, bridging the divide between curriculum and campus operations to build a best-in-class living lab. The lab brings together the technology, systems and resources to make the most of these sustainability and renewable energy assets.

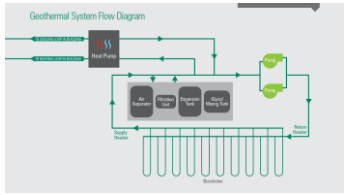
View Your Campus Space Differently
- Planning for an onsite power solution required looking at Durham College's space differently, imagining the footprint of a geothermal plant in the middle of campus.

Take Advantage of Policy Trends
- Ontario was the first coal-free electricity grid (implemented in 2014), and Siemens helped Durham utilize government incentives resulting from carbon pricing to fund this greenhouse gas reduction project.

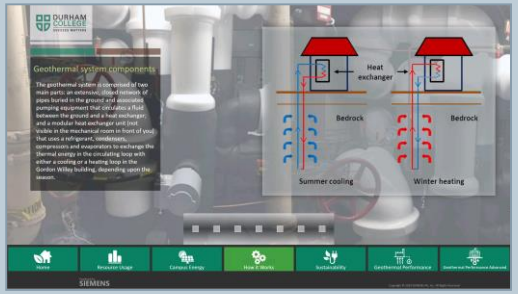
Tight Higher Education Timelines: "It Can Be Done"
- With only a 12-month timeline for development and construction, the Siemens project team was able to construct during a cold Ontario winter, meeting a March 31st deadline by implementing a two-phase commissioning plan centered around heating and cooling seasons.

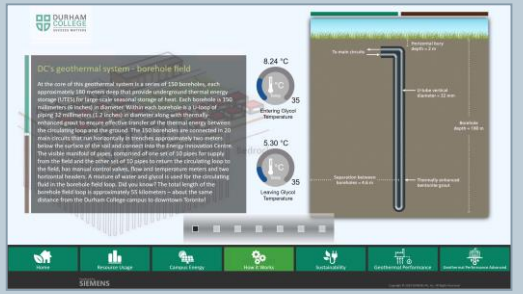
How does it work?

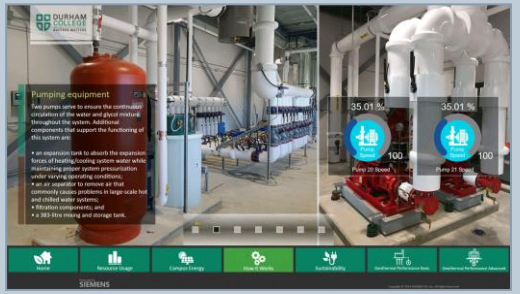
The Durham College Simcoe geothermal system is designed to provide year-round comfort for interior spaces within the Gordon Willey building while using a clean and renewable energy resource. the system is technically sophisticated and based on simple-to-understand concepts of heat transfer. It works by continuously exchanging thermal energy between the air in buildings and the ground, where the temperature stays constant at approximately 10 ºC throughout the year. This Geothermal Ground Source heat Pump system is also commonly referred to as a "Geo-exchange System".

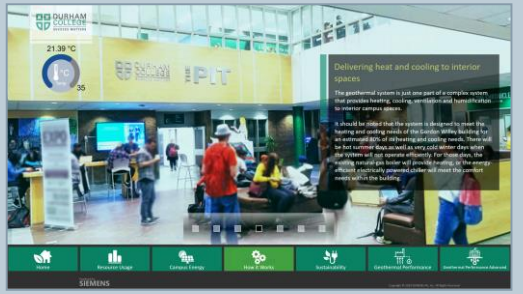


A 7-unit heat pump in the main mechanical room operates in either a heating mode or a cooling mode. The system is designed to provide heating using the natural thermal energy in the ground for the majority of the heating season. When temperatures fall in the range of -10 ºC to -5 ºC, the heating needs within the building will exceed the design of the system and natural gas boilers will be used to meet the heating demand.









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