



ENERGY CATALYST

Geothermal Heat Pump Manufacturer
Design Build Contractor

NYGEO TOP JOB WINNER 2026

An Engineering Success Story

Hawthorne Valley Waldorf School
Ghent, NY



Project Overview



Installation of 17 Twister Geothermal Loops

Challenge

Hawthorne Valley School had ambitious targets to go net-zero across their campus. This would require replacing fuel oil boilers across 5 buildings.

High Temperature Baseboards



All buildings had high-temp baseboards and extremely little space for new ductwork.

Limited Budget



The 45,000 sq ft retrofit had a budget of around \$2M and needed to achieve a COP of at least 4.

Limited Power



Hawthorne was constrained by having a 600 amp substation and air-source heat pumps would have required a major electrical upgrade.

Solution

- Energy Catalyst installed (12) 8-ton Double-Hybrid heat pumps and reused the school's existing baseboard.
- Each heat pump can deliver energy as a Hybrid:
 - 80% high efficiency hot water (up to 130°F)
 - 20% hot air to unlock full system capacity
- Each HP has an integrated Building Management System and the heat pumps coordinate like a single, intelligent central plant.

Outside

A combination of vertical and horizontally drilled heat exchangers were used. The horizontal drilling allowed tie-in piping to pass under roads and playgrounds without damage.

The system used (17) 500ft deep Twister geothermal loops, which are more cost effective than traditional U-bends.



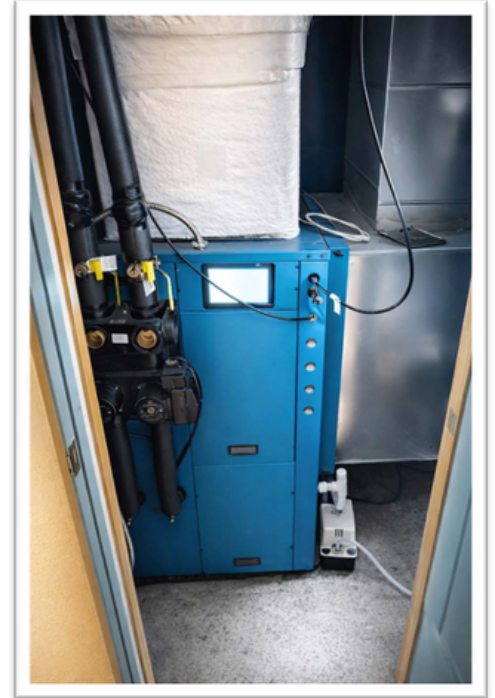
Our Project Contributions

↗ Performance On A Budget

The geothermal entering loop temperature from the Twister borefield never dropped below 40°F in the winter (excellent performance) despite using 125 ft of borehole per ton of HP capacity.

The heat pumps delivered a seasonal average efficiency between 4.5-5 COP, exceeding expectations.

Despite initial setbacks, the construction project was completed within the school summer break on time and budget.



① Design Concept

↗ Heat load measurements. The duct, plumbing and ground loop design

② Twister Manufacturing

↗ Twister geothermal loops are manufactured at our factory in Troy, NY

③ Drilling/Borefield Installation

↗ Energy Catalyst performed the entire geothermal installation, including drilling, looping, grouting and underground tie-in piping.

④ Heat Pumps

↗ Energy Catalyst manufacturers variable speed geothermal heat pumps at our factory in Troy, NY.

⑤ Ongoing Support

↗ Integrated Building Management System (BMS) and remote monitoring ensure smooth operation over the life of the system.



Lessons Learned



Matt Desmarais with John Thomas of WaterFurnace, who sponsored the competition

➤ Post Project Analysis



Matt Desmarais
Founder Energy Catalyst

"Reusing existing high temperature baseboard in a commercial building is easy in principle and hard in practice. The challenge is that it's very difficult to know which rooms need extra heat ahead of time and with low supply temperature from the heat pump, it's not very forgiving. That's where the hybrid approach works well- a little bit of supplemental air get's added wherever it's needed and ensures success everytime."

➤ Customer Feedback



Martin Ping
Hawthorne Valley Executive Director

"It is no small feat that we were able to complete a massively complex undertaking in five buildings, some two hundred years old, on budget. It is heartening to come to school on days when the temperature is below zero, see no smoke coming out of any chimneys, and walk into warm and welcoming spaces."

