

Syracuse University Green Data Center

<http://construction.com/community/publicphoto.aspx?plckPhotoID=652d18ab-65fe-42a8-aa6a-f394de9230db&plckGalleryID=ff5e0b10-7620-416d-a973-23fa1d4e4066>

Announced in late May 2009 and constructed in just over six months, the \$12.4 million, 12,000-square-foot Green Data Center (6,000 square feet of infrastructure space and 6,000 square feet of raised-floor data center space) uses an innovative on-site power generation system for electricity, heating and cooling, and incorporates IBM's latest energy-efficient servers, computer-cooling technology and system management software. The GDC is anticipated to use 50 percent less energy than a typical data center in operation today, making it one of the world's "greenest" computer centers. The facility will be a platform from which SU and Big Blue offer research and analysis services for organizations looking to build new or renovate an existing data center. The growing demand for computing, Internet and online services has led to the growth of data centers and resulting dramatic increases in their energy consumption and costs. A typical data center uses up to 30 times more energy than a typical office building, and total data center energy use is doubling every five years. Improving data center energy efficiency offers significant energy cost savings and environmental benefits. The SU GDC features an on-site electrical tri-generation system that uses natural gas-fueled microturbines to generate all the electricity for the center and cooling for the computer servers. The center will be able to operate completely off-grid. A new liquid cooling system was designed that uses double-effect absorption chillers to convert the exhaust heat from the microturbines into chilled water to cool the data center's servers and the cooling needs of an adjacent building. Server racks incorporate "cooling doors" that use chilled water to remove heat from each rack more efficiently than conventional room-cooling methods. Sensors will monitor server temperatures and usage to tailor the amount of cooling delivered to each server—further improving efficiency. Part of GDC's energy savings can be attributed to its use of DC power. In the GDC, DC power is delivered directly at the appropriate voltage to IBM System z10 servers, thus eliminating waste from conversions. By embracing DC, the school also manages to reclaim precious floor space that would otherwise be lost to additional conversion equipment – plus, there's the overall green benefit of having fewer pieces of IT equipment manufactured and delivered to the institution. The GDC was built using the Design-CM methodology in a record amount of time considering the projects great complexity and ingenuity. Sister companies VIP Architectural Associates, PLLC and VIP Structures, Inc.



Capstone Hybrid UPS microturbines are installed at Syracuse University's Green Data Center.

designed and built the state-of-the-art structure. Both firms are managed by LEED® accredited professionals who have a firm commitment to building inventive and sustainable facilities. The project is registered with the U.S. Green Building Council. SU is seeking certification under the USGBC's Leadership in Energy and Environmental Design (LEED) program, with a goal of achieving a Silver rating.

Quick Facts:

- More than 25,000 linear feet of electrical conduit, equivalent to about 83 football fields or 4.5 miles, has been used on the project.
- Over 120,000 linear feet – more than 22 miles – of wire was used in the construction of the electrical systems.
- Almost one mile of piping is used in the heating and cooling systems.

Building Team/Key Players:

Architect: Joel F. Cheely, AIA, LEED® AP, Architect, VIP

Architectural Associates, PLLC; Construction Manager: James E. Herr, LEED® AP, VIP Structures, Inc., IBM, NYSERDA, Syracuse University

Location: Syracuse, NY