

## **Sustainable, Affordable, Low-Temperature Water System to Heat and Cool a Neighborhood of Buildings**

***Impact:*** Pennsylvania's tremendous water resources represent a rich supply of renewable energy that is largely untapped. In fact, all of the Commonwealth's historic towns and cities were founded on top of and adjacent to these resources. Development and redevelopment with geothermal networks will support sustainable economic growth, energy efficiency, a reduced carbon footprint, and significantly lower energy costs. The market for this product includes owners and developers of mixed-use developments or redevelopments, data centers, technology parks, retail centers, college campuses, hospitals, and manufacturing facilities.



***Project Overview:*** This project team will design an innovative central aquifer loop linked to building heat pump loops, manufactured and developed by Geothermal Energy Systems, Inc. (GESI). This dual-loop system will be a sustainable method to heat and cool buildings using renewable energy rather than fossil fuels, which will allow for ongoing energy- and water-efficiency, utility cost savings, and reduced carbon emissions. The project team will meter and make final design improvements to GESI's newly patented aqua-thermal system.

***GBA Product Innovation Grant Amount:*** \$45,736

***Leadership Team:*** The project team includes Vivian Loftness, FAIA, Professor in the Center for Building Performance & Diagnostics at Carnegie Mellon University (CMU); Nina Baird, Graduate Student at CMU; Gerald Mattern, P.E., Adjunct Professor at CMU and in private practice specializing in geothermal system installation; and Robert Yoder, Sr., President and CEO of Geothermal Energy Systems, Inc.

***Contact:*** Tom Harley ■ Geothermal Energy Systems ■ 724.349.2520 ■ [tharley@trarchitects.com](mailto:tharley@trarchitects.com)