The Ohio State University is a large, public university whose main campus in Columbus, Ohio, United States includes academic, laboratory, research, dormitory, and office buildings, as well as athletic facilities and a large full-service research and teaching hospital.

The hospital as well as associated academic and medical research buildings are located on the south side of campus. A large chiller plant, built in 2011, supplies chilled water to buildings in the area via a system of both direct-bury piping and utility tunnels. When analyzed holistically, these buildings showed a high opportunity for heat recovery, with a base load of more than 900 tons of chilled water usage in winter and around 10,000 tons of peak demand in summer. On the heating side, winter peaks were around 50,000 MBH and summer base load is near 10,000 MBH.

Having all the chilled water (CHW) loads connected to the same location brings better diversification, which leads to more constant loads and better heat recovery potential than in individual buildings. The missing component needed to realize high levels of energy savings was a central heating station.

Previously, steam was being converted to hot water in each building. With a centralized heating system, savings can be achieved by recovering the heat that was being rejected by the existing chillers to the environment through cooling towers. Now, this energy is used to heat water which is supplied to the buildings by a new district heating hot water network (HHW). A very efficient high temperature and high-capacity Heat-Recovery Chiller (HRC) is used to generate both HHW and CHW while producing energy savings.

The scope of the energy-saving project:

* The addition of a new 1500 ton heat-recovery chiller in the chiller plant
* Installation of new Heating Hot Water distribution pipes to 5 buildings
* Steam-to-hot water heat exchangers for backup, as well as in-building piping and heat exchanger work required to convert these buildings from being supplied with steam to hot water supply.

Five buildings were connected to the new HHW district. These five buildings are three academic/research buildings and two hospital buildings. Total area of the five buildings: 1,731,000 ft2.

One of the key challenges in designing and executing this project was balancing the needs of the various stakeholders involved, including the University, The Wexner Medical Center, and the surrounding community. To address this challenge, the project team focused on involving the end-users early in the design phase and all throughout the construction phase of the project.

The construction phase of this project required understanding the operating needs of diverse end-users, such as classrooms, research laboratories, and a full-service hospital. The project team worked closely with the University and the Medical Center to ensure that their operations were not adversely affected throughout the construction process.