Neighborhood in City of Troy Category A Feasibility Study NYSERDA PON 4614

Rensselaer County

Technical Lead: CHA Consulting & Siemens Industry, Inc.

Anticipated completion of study/availability of final report: October 2021

V2 7/2021

The Site & Beneficiaries

Two groupings of existing/new construction mixed-use buildings near the downtown section of the City of Troy with 16 buildings. The Northern Node will be anchored by new construction of a mixed-use building and serving numerous adjacent existing buildings. The Southern Node will be anchored by redevelopment of existing buildings at a college and redevelopment of three affordable housing sites. The two nodes are separated by approximately 1,000 feet and subsequent phases will explore in-fill to possibly connect the two. The target buildings currently are a mix of existing water source heat pumps, natural gas steam systems and natural gas furnaces. These 16 buildings, collectively over 700,000 square feet, will be analyzed to explore district-style heat pumps with additional supplemental heating and cooling systems. These 16 buildings have diverse occupancy patterns and thermal load profiles, consisting of multifamily-residential, dormitories, and office buildings. The analysis will quantify the peak of the composited thermal load and compare it to the sum of the individual peaks in order to assess the load-flattening benefits of aggregating into a district. The study will additionally explore the feasibility of expansion of the system to include 23 additional downtown buildings and future mixed use development in a brownfield development area.

Potential Thermal Resources

The primary opportunity anticipated will leverage ground-coupled boreholes to provide a year round heat source and sink for all connected buildings with several potential supplemental sources, such as air-source heat pumps, thermal storage, water body thermal resource (Hudson River), and/or sewage water.

Potential Configuration

Will explore a district ambient loop design, consisting of a central ambient temperature loop, which serves a mixture of existing water source heat pump systems, upcoming new developments and major HVAC renovation projects (5G design consisting of a heat pump installed at each building where such heat pump would extract heat from, or reject heat to, the district's closed-loop ambient-temperature water pipe). Benefits of this configuration include: opportunity to integrate with existing thermal infrastructure and use the heat pumps as the first-call (reserving the fossil fuel systems as supplement to meet extreme peaks or for systemwide redundancy for resilience).