National Fuel Gas Neighborhood in Buffalo Category A Feasibility Study NYSERDA PON 4614

Erie County

Technical Lead: Wendel

Anticipated completion of study/availability of final report: January 2022

V1 6/2021

The Site & Beneficiaries

A neighborhood consisting of 10 existing single-family homes and an existing commercial building in Buffalo, where the homes are on a side street across a main street from the commercial building. Each home has an individual natural gas fired heating system, and the commercial building is part of a complex that has an existing district steam system, district hot water, and district chilled water system with distribution piping infrastructure fed from a central plant that has five steam boilers and a cogeneration plant. The commercial building is approximately 100,000 square feet. Coupling the homes with the commercial building will improve the diversity of occupancy patterns and thermal load profiles, this configuration will be analyzed to explore district-style heat pumps. The analysis will quantify the peak of the composited thermal load and compare to the sum of the individual peaks in order to assess the load-flattening benefits of aggregating into a district.

Potential Thermal Resources

The primary opportunity anticipated will leverage heat recovery heat pumps to move heat from one building to another, and supplemental thermal resources, if needed, could include ground-coupled boreholes.

Potential Configuration

A utility ownership model will be explored as a pathway to decommission vintage cast-iron gas delivery pipes, including operation of the district thermal system using the Heat as a Service (HaaS) model. The study will explore both options of a 4G design consisting of a central Thermal Building that houses the heat pumps and from which hot water and chilled water will be distributed via conveyance pipes to the end-use buildings (simple radiators can be used in the end-use buildings), and a 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.