Innovation QNS
Category A Feasibility Study
NYSERDA PON 4614

Queens County

Technical Lead: Endurant Energy (formerly GI Energy)

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

V1 6/2021

The Site & Beneficiaries

Innovation QNS will be new construction of a mixed-use complex in the Astoria section of Queens spanning several city blocks with numerous buildings to be owned by different entities. A cluster of numerous buildings, collectively a significant number of square feet, will be analyzed to explore district-style heat pumps. These buildings have diverse occupancy patterns and thermal load profiles, consisting of offices, a supermarket, retail, community spaces, multifamily-residential, senior housing, and affordable housing. 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.

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, energy foundations, air-source heat pumps, and/or sewage water.

Potential Configuration

The mix of high-rise and low-rise buildings lends itself to a district-style approach so as to access surplus ground-coupling resources below the low-rises in order to assist with serving the thermal demand of the high-rises. Will explore 4G design, consisting of a central Thermal Building, which 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). Benefits of this configuration include: opportunity to integrate with other supplemental 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); focusing the location where electric infrastructure upgrades are needed to meet the expanded electrification demand to occur at the Thermal Building (as opposed to at the end-use buildings) to minimize disruption to mission-focused activities during construction; and cost containment.