

Penn South, Chelsea, Manhattan Community Heat Pump Systems

Category A Site-Specific Scoping Study

NYSERDA PON 4614

New York County

Technical Lead: Egg Geo LLC



The Site & Beneficiaries

Egg Geo is leading a team to study low- and no-emission heating and cooling for Penn South's 29 neighboring buildings, approximately 6.1 million square feet of floorspace, in the Chelsea, Manhattan neighborhood. Penn South has a mix of commercial and residential structures spread out over five city blocks from 29th St to 23rd St between 8th and 9th Avenues in Manhattan. Across the single-owner, limited-equity, cooperative property there are ten 22-story residential buildings, two one-story retail commercial buildings, one three-story retail and tennis recreation, one two-story theatre, one three-story commercial medical office, and one three-story powerhouse. Within the boundaries of the residential towers are other owners with different use types, such as schools and churches. In the adjacent blocks are university campuses including the Fashion Institute of Technology (FIT), municipal government offices, transportation hubs such as Amtrak's Penn Station, and Environmental Justice Areas.

Potential Thermal Resource

Penn South has its own Combined Heat and Power (CHP) Plant and produces its own electricity. Residential areas are completely disconnected from Consolidated Edison (Con Ed) electric, but they still use natural gas. Each of 2820 apartments uses dual-temperature hot and cold water for fan coil units with domestic hot water (DHW) fed to each apartment from the powerhouse. While there is adequate geothermal heat exchange capacity onsite, other sources of heat exchange may be more economically feasible than a single-owner system. Alternative energy sources including the Metro Transportation Authority's (MTA) dewatering operations, wastewater heat transfer, or cross-property boundary load integration with two local churches, with Tishman Speyer's Morgan North, or with the FIT can increase heating and cooling diversity.

Potential Configuration

The leading replacement for retiring onsite combustion equipment is likely centralized ground source heat pumps, but the study team hopes to expand the scope to enable the use of low- and no-drill alternatives. The remaining infrastructure will include the chilled water distribution system, but a geothermal network will allow retiring of Penn South's onsite cooling towers saving up to 280,000 gallons of freshwater per day.