ETTINGER ENGINEERING ASSOCIATES

CASE STUDY

Greenwich Club Residences

PROJECT SPECIFICS:

- Greenwich Club Residences, 88 Greenwich Street New York, NY 10006
- 37 storeyed, 466' tall, R-2 high rise building with commercial/retail space at the ground and 2nd floor level
- 489,840 gross sqft
- Constructed in early-1900s; renovated to MF residential building in 1999; upgraded to luxury condo in 2008.
- NYSERDA's FlexTech program participant
- ASHRAE Level II energy audit conducted
- Local Law 97 analysis conducted and EEMs recommended
- Undergoing EEM installation

As part of New York City's Climate Mobilization Act, Local Law 97 of 2019 imposes restrictions on GHG emissions for large buildings in NYC. Greenwich Club Residences, at 88 Greenwich St. New York, was focus of a detailed technical study that included the following:

- ASHRAE Level II energy audit
- Utility cost analysis
- Building simulation and analysis
- Energy Efficiency Measures (EEM) analysis
- Cost evaluation & recommendations

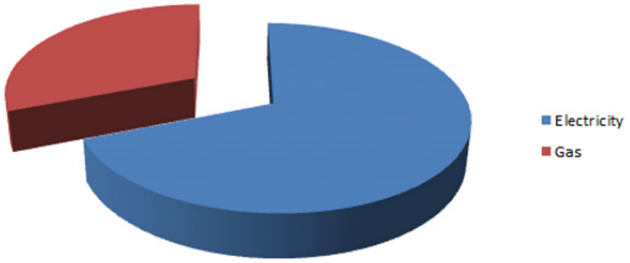

Figure 1 Energy Cost by fuel type – utility cost analysis

Statistics based on 2017 Benchmarking Dataset for ~20K NYC Multifamily Buildings	
% buildings over LL97 Limit 2024-29 (Approx.)	12%
% buildings over LL97 Limit 2030-34 (Approx.)	60%
% buildings worse than Greenwich Club Residences (Approx.)	21%

Figure 2 Emissions Statistics of nearly 20,000 NYC Multifamily Buildings based on 2017 Benchmarking Dataset

KEY TERMS:

EXISTING BUILDING; NYC LOCAL LAW 97; NYC LOCAL LAW 33; ENERGY EFFICIENCY GRADE; ASHRAE ENERGY AUDIT; ENERGY EFFICIENCY MEASURE; MIXED-USE BUILDING; BUILDING SIMULATION

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ENERGY EFFICIENCY MEASURES STUDIED:

- Replace existing DHW heater serving floors 27-37 with new condensing boilers
- Replace existing DHW heater serving floors 27-37 with air source heat pump boilers
- Replace two steam boilers with new condensing boilers
- Replace steam boilers with new air source heat pump boilers
- Draft controller for steam boilers
- Water source heat pump units in apartments
- Apartment refrigerators
- Apartment faucets and shower heads
- Windows SHGC improvement via laminate applied layer
- Weather Stripping
- Ventilation strategies
- Front of House Lighting
- Automatic bi-level staircase lighting
- Exterior Lighting Photocell Controllers
- Water source heat pump units in lobbies and low-zone corridors
- Insulated Jackets on domestic hot water storage tanks
- Exhaust air energy recovery – High Zone Corridors
- Exhaust air energy recovery – Low Zone Corridors
- Combined heat and power plant operation strategy A OR B
- HVAC Controls
- Sub-metering
- RETAIL ONLY - Doors in museum and other retail spaces
- RETAIL ONLY - Retail domestic hot water heater
- RETAIL ONLY - Retail WSHP units

Figure 3 Steam boilers currently in use

EEMs were prioritized based on NPV and potential to minimize LL97 fines. Measures like electric heat pump boiler, deploying in-line flow restrictors, weather-stripping at the envelope, ERVs on reduced ventilation, high-efficacy lighting fixtures and automatic controls, BMS controls etc. are recommended for implementation.

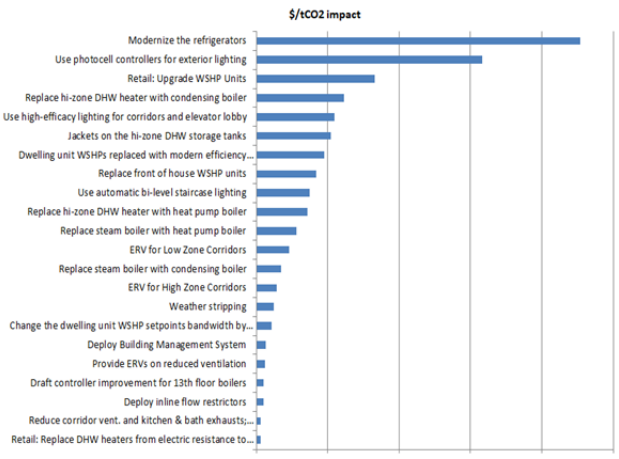

Figure 4 $/tCO2 impact