

## Deep Energy Retrofit Saves Multifamily Building \$503,000 Annually

After upgrading the existing mechanical systems, cogeneration (CHP) and rooftop solar systems were installed to increase resiliency and further reduce energy spending



Multifamily

### Property Profile

- Location: Forest Hills, Queens
- Square Footage: 429,000
- Units: 424
- Year Built: 1965
- Building Type: Cooperative

### Services

- Engineering Design and Implementation
- Mechanical Systems
- Lighting
- On-site Generation: Cogeneration (CHP)
- Renewable Energy: Solar PV
- Resiliency
- Project Construction Management
- Commissioning
- Rebates & Financing

### Project Achievements

#### Phase I

- Total Annual Energy Savings: 23,600 MMBTU
- Annual Cost Savings: \$333,000
- Total NYSERDA Rebates: \$466,000
- Total Project Cost after Rebates: \$1,580,000

#### Phase II

- Total Annual Generation: 1,476,000 kWh
- Annual Energy Cost Savings: \$170,000
- Total NYSERDA Rebates: \$561,000
- Total Project Cost after Rebates: \$1,068,000

### Project Highlight

- Phase I: Source energy reduction of 23% & \$333,000 in annual energy savings
- Phase II: Integration of solar and CHP with one another and into existing systems, green leadership, and \$170,000 in annual energy savings

A deep energy retrofit may seem daunting due to its required capital investment and time. Yet, a holistic, integrated retrofit plan is the key to better building performance and major energy savings. The Fairview, a 424-unit multifamily residence in Forest Hills, Queens, hired EN-POWER GROUP to design and implement a deep energy retrofit and install on-site generation technologies in order to significantly decrease its energy consumption as well as increase its resiliency.

Through engineering and financial analysis, our engineers recommended and ultimately designed and project managed the following measures for Phase I of the retrofit: Converting the heating plant from oil #6 to lower cost, cleaner natural gas, eliminating summer boiler steam production by installing a direct-fired chiller, installing dedicated domestic hot water (DHW) heaters, installing high efficiency pump motors as well as variable frequency drives (VFDs) on pump and fan motors, and upgrading all interior and exterior lighting. These improvements reduced the Fairview's source energy use by 23% and allowed the facility to save \$333,000

annually. Moreover, EN-POWER GROUP secured \$466,000 in grants from NYSERDA, which helped the project achieve a lifetime return on investment (ROI) of 68%.

As a result of Superstorm Sandy, the Fairview decided to protect itself during future extreme weather events by integrating resiliency planning into its building infrastructure – which was of special concern as the building sits within a floodplain. Based on detailed load calculations, EN-POWER GROUP engineers installed an 82-kW solar photovoltaic (PV) system along with a 300-kW cogeneration system for Phase II of the retrofit. Cogeneration, also known as “combined heat and power (CHP)”, is a technology that generates electricity on-site while also recovering the thermal energy-byproduct for other uses. Not only is this an extremely efficient process, but CHP also acts as an emergency generator to provide power to essential building systems during power outages. These resiliency improvements generate 1.5 million kWh annually to save the Fairview \$170,000 each year. Again, EN-POWER GROUP secured rebate funding from NYSERDA, this time totaling \$561,000.