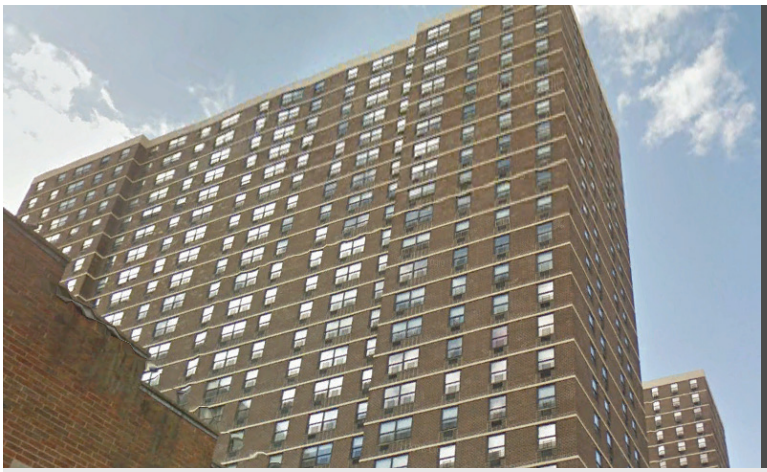
EN-POWER GROUP | Case Study

Ventilation System Upgrade Improves Indoor Air Quality (IAQ) and Resident Comfort while Saving Energy and Carbon Emissions

Targeted exhaust ventilation project at 490-unit multifamily facility yields major benefits with 2.4-year payback



Multifamily

Property Profile

- Location: Two Bridge Neighborhood, Manhattan
- Square Footage: 620,000
- Units: 490
- Year Built: 1979
- Building Type: Low to Middle Income Housing

Services

- New York City Local Law 87
- Mechanical Systems: Ventilation
- Engineering Design
- Project Construction Management
- Rebates & Financing

Project Achievements

265 Cherry Street Energy & Carbon Improvements:

- ENERGY STAR Score of 65 achieved, an improvement from 52
- ENERGY STAR Letter Grade improved from D to C
- Local Law 97 avoided penalty: $39,300

275 Cherry Street Energy & Carbon Improvements:

- ENERGY STAR Score of 72 achieved, an improvement from 58
- ENERGY STAR Letter Grade improved from C to B
- Local law 97 avoided penalty: $40,800

Project Highlights

- EN-POWER's engineering team upgraded and balanced the facility's entire ventilation system by installing 67 direct-drive rooftop fans, cleaning and sealing 67 risers, and installing 1,350 CARs and 1,350 UL-555 fire dampers in the apartments.
- One of the newly installed fire dampers was activated during a kitchen fire, thereby stopping the propagation of the fire to other floors. energy savings
- Total Incentives Received: $301,500
  Total Annual Savings: $168,786
  ROI and Simple Payback with Incentives: 62% and 2.4 years

265-275 Cherry Street hired EN-POWER GROUP to address issues with their ventilation system. Issues they faced included:

- Complaints of smells spreading between apartments,
- Uneven air exhaust rates from bathroom and kitchen registers, meaning some spaces received no air flow while others received too much,
- High-maintenance belt-driven fan motors that wear out and must be regularly inspected and replaced,
- Noisy rooftop fans that bothered residents on the upper-floors, and
- Overly-sized rooftop fans that did not adhere to current code requirements and wasted energy.

Our engineers needed to measure and diagnose the cause of these issues. A detailed study, measuring exhaust air flow rates in kitchens and bathrooms, led our engineers to determine air flow was imbalanced, exceeded or did not meet current code requirements (ranging wildly from 0 to 200 cubic feet per minute, CFM), and leaked out of the ductwork through gaps (especially where drywall meets the concrete slab).

Our engineering team then turned its attention to the exhaust fans themselves on the rooftops and determined they needed to be replaced with modern, appropriately sized fans. The prior fans installed were grossly oversized and relied on outdated, noisy, and unreliable belt-driven motors.

To address indoor air quality (IAQ) concerns and reduce energy and carbon emissions, EN-POWER's engineers implemented the following strategy:

- Cleaned exhaust ducts and apartment registers,
- Sealed exhaust ducts and apartment registers to eliminate air leaks as best as possible,
- Installed constant airflow regulators (CARs) in the kitchen and bathroom registers to balance air flow from each register, helping ensure air flow could be balanced,
- Installed UL-555 rated fire dampers at the registers, designed to close during fires to prevent flames from spreading through ductwork and reaching other apartments,
- Replaced existing fans with appropriately-sized fans to match the exhaust rates from the apartments, and
- Selected modern direct-drive motors for the fans, which require less maintenance, consume less electricity, and produce much less noise when operating.

The exhaust ventilation upgrade had immediate benefits in indoor air quality and resident comfort. Exhaust rates were now balanced and met code minimums, being designed to and achieving 25 CFM in the bathrooms and 40 CFM in the kitchens throughout the building. For residents of 265 & 275 Cherry Street, this meant those on the lower floors could no longer smell their neighbors' cooking or smoking while those on the top floors noticed the elimination of fan noise levels.