

Roosevelt Landings

300-kW CHP System

Mixed-income multifamily complex utilizing a power-purchase agreement and financing from NYC Energy Efficiency Corporation



Roosevelt Landings Multifamily Housing Complex

COURTESY OF NYCEEC

Quick Facts

- LOCATION:** Queens, New York
- MARKET SECTOR:** Multifamily Housing
- FACILITY SIZE:** 9 buildings with over 1,000 units and 1 Million sq. ft.
- EQUIPMENT:** 3 x 100kW Tecogen Microturbines
- FUEL:** Natural gas
- CHP TOTAL EFFICIENCY:** 83% HHV
- USE OF THERMAL ENERGY:** Domestic hot water
- ENVIRONMENTAL BENEFITS:** Generates 15% of site electricity and offsets boiler usage
- TOTAL PROJECT COST:** \$8 Million; including cogeneration, upgraded boilers, programmable thermostat system, and total building envelope sealing
- YEARLY ENERGY SAVINGS:** 5.5% total source energy for cogeneration, 18.2% total project
- CHP IN OPERATION SINCE:** 2013
- NOTE:** PPA agreement and NYCEEC financing allowed for CHP investment with no debt to building owners

Project Overview

Roosevelt Landings is a mixed-income multi-family housing complex located on Roosevelt Island in Queens, NY. Built in 1969, the complex has more than 1,000 units and 1 million square feet across nine buildings. Roosevelt Landings sought to make significant investments in energy efficiency and resiliency for their tenants, striving to lessen their upfront project costs. Roosevelt Landings serves an example for similar buildings with old systems and electric-resistant heat to find low-cost energy efficiency solutions.

To meet their efficiency and resiliency goals, the building owners pursued a total-building efficiency retrofit, including building envelope sealing, insulation, efficient boilers, and CHP. With the complex utilizing electric heating, the size of the CHP system was limited to the needs for domestic hot water. However, the CHP is still sufficiently sized to provide backup power to critical systems in the complex in case of a grid outage.

In order to minimize the building owner's up-front costs, Roosevelt Landings partnered with Urban American to form a third-party energy provision entity, Urban Greenfit. Urban Greenfit took on the up-front cost and debt of the project, which Roosevelt Landings paid back through a Power Purchase Agreement (PPA) and Energy Services Agreement (ESA). The PPA procures energy and electricity from the CHP system at a fixed rate, while the ESA is funded through payments for achieved energy savings relative to the building baseline pre-project.

CHP Equipment & Operation

Roosevelt Landings has installed three 100kW Tecogen Inverde INV-100 CHP units, owned and operated by Urban Greenfit. The units provide ultra-high efficiency and low emissions, making them ideal for the needs of the project.

The Tecogen Inverde INV-100 is rated for 28.6% electric efficiency and 80.8% overall efficiency, both high heating value. It achieves this partly by recovering heat from both the engine jacket and exhaust, and the generator and power electronics. It also emits less than 0.07 pounds of NOx, 0.2 pounds of CO, and 0.1 pounds of VOC per MWh of electricity generated.

To meet Roosevelt Landings' resiliency needs, the Inverde INV-100 has rapid black-start for grid-independent operation, in addition to cloud-based, real-time performance monitoring via Tecogen's CHP Insight, allowing Tecogen to monitor the maintenance and operation needs remotely.



The Urban Greenfit team with a Tecogen InVerde Ultra INV-100

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Power-Purchase Agreement, Energy Services Agreement, and NYCEEC Financing

To structure the investments in CHP and energy efficiency, Roosevelt Landings partnered with Urban American to create the energy services company Urban Greenfit. Urban Greenfit funded the efficiency and CHP investments, and Roosevelt Landings paid Urban Greenfit for the energy supplied, or in the case of the efficiency investments, for the value of the reduction in energy use relative to a baseline prior to the efficiency investment.

The Energy Services Agreement (ESA) is structured as a 10-year contract for avoided energy usage, relative to the complex's performance prior to the efficiency upgrades. If the building performs at the baseline or above, Roosevelt Landings does not pay Urban Greenfit. However, if energy usage is below the baseline, Roosevelt Landings will pay for the saved energy. Reduced utility bills for the complex offset the payments for energy savings. Additionally, the Power Purchase Agreement (PPA) is also for 10 years. The complex purchases the heat from the CHP system at the prevailing market price for fuel, plus an additional 33% of the fuel price for the electricity generated by the CHP, which is still below utility rates due to the efficiency of CHP.

"We first presented [this CHP project] to our equity investors who were sophisticated in real estate, but not necessarily in energy efficiency. But we were projecting a substantial return over 10 years and even though we had outside investor interest, we didn't need it."

—Joshua Eisenberg, Urban American

To fund the combined PPA and ESA projects, the NYC Energy Efficiency Corporation (NYCEEC) provided a \$4.5 million loan to bridge the timing differentials of the incentives received by the project. NYSERDA provided \$750,000 in incentives for the CHP project, as well as a no-interest \$500,000 loan for the project overall, serviced by NYCEEC. The project also received \$450,000 in Federal and utility grants, leaving \$1.8 million of the \$8 million project cost to owner investment.

For More Information

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