

Energy Efficiency for Newark Housing Authority

Building efficiency measures expected to cut energy costs and save nearly \$300MM over course of two-phase project



Challenge

Founded in 1938, the Newark Housing Authority (NHA) has been recently challenged by the aging infrastructure of a number of its apartment buildings and townhomes. Heating systems have approached near end-of-life in many buildings, resulting in costly repairs. And energy costs have been growing due to inefficiency, so the NHA set aggressive goals in 2006 to modernize and improve the efficiency of its buildings. As one of the largest public housing authorities in the U.S.—which includes a portfolio consisting of 414 buildings with 12,000 units that house 30,000 residents—NHA required substantial resources to meet its goals.

Solution

NHA entered into two Energy Performance Contracts (EPCs) with Constellation. Phase 1 began in 2011 and, based on its success, Phase 2 began in 2015 and resulted in the largest EPC ever approved by the U.S. Department of Housing and Urban Development (HUD). These EPCs enabled NHA to implement \$134 million in energy efficiency improvements with no upfront capital as the projects were funded by the guaranteed utility cost savings from the efficiency upgrades. Energy Conservation Measures (ECMs) with short- and long-term paybacks were bundled to help fund infrastructure upgrades.

ECMs in Phase 1 included energy efficient lighting, water conservation, window replacements, outside air resets, boiler stack economizers, boiler decentralization, and cogeneration. Phase 1

ECMs totaled \$50 million in capital improvements to apartment buildings and senior living centers, and will save an estimated \$78 million over 15 years.

The project also involved cogeneration, a widely-accepted energy generation method that simultaneously produces power and thermal energy. Five packaged-type cogeneration units were installed to service three high-rise developments comprised of 924 units. The units provide heat for domestic hot water and up to 1,596 MW hours of electricity. Co-locating the units avoids transmission costs, and the cogeneration system is anticipated to cut approximately \$223K in annual utility costs, reduce greenhouse gas emissions, and provide backup power during outages.

Due to performance exceeding forecasts in Phase 1, the NHA added Phase 2 to make capital improvements to townhouse complexes and a senior living building. Phase 2 ECMs total \$84 million and are projected to result in \$219 million in savings over 20 years. ECMs include new boilers and domestic hot water systems; more energy-efficient windows, blinds and patio doors; roof replacements with repaired ventilation and storm drainage systems; solar panels; a roof-mounted wind turbine; conversion of an all-electric building to natural gas heating; and new common area heating systems for senior high-rise buildings.

To further reduce greenhouse gas emissions and increase sustainability, NHA expressed an interest in installing onsite



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Highlights

Project

- Phase 1: \$50 million in energy conservation measures, estimated \$78 million in savings over 15 years
- Phase 2: \$84 million in energy conservation measures, expected \$219 million in savings over 20 years
- 15-year (Phase 1) and 20-year (Phase 2) Energy Performance Contracts
- An estimated 20,000 metric tons of greenhouse gas reduction, the equivalent to removing more than 4,200 cars from the road for a year

Technical

- 144 MW hours capacity solar PV
- 14 MW hours capacity wind turbine
- 5 packaged-type cogeneration module

renewable energy sources. A 14 MW hours capacity wind turbine will therefore be installed on the rooftop of a building, along with 144 MW hours capacity solar PV arrays on south facing rooftops of several buildings.

Constellation employed 10 NHA residents and hired four HUD Section 3 local businesses to provide materials and services during the design and construction of the project's first phase. The company will employ two full-time associate site superintendents through HUD's Section 3 jobs program to assist in monitoring and maintaining energy conservation measures for the duration of the EPC. Additionally, Constellation contributed more than \$100,000 to the program's training fund to allow the NHA to incorporate job training programs for residents.

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