



## NYCHA: USING ENERGY PERFORMANCE CONTRACTS TO IMPLEMENT A PORTFOLIO-WIDE CAPITAL AND ENERGY PLAN

### SOLUTION OVERVIEW

The New York City Housing Authority (NYCHA) is the nation's largest residential landlord, with a public housing portfolio that serves 400,000 of New York City's lowest-income households who have few or no housing alternatives.

In its 2016 NextGeneration NYCHA Sustainability Agenda, NYCHA set goals to reduce per-square-foot energy consumption by 20 percent by 2025, and reduce its carbon emissions by 30 percent by 2027. These goals reflect NYCHA's commitments for the Better Buildings Challenge and the NYC Carbon Challenge, respectively. Meeting these goals across more than 176,000 apartments in 2,600 mid-20th Century buildings will require both operational improvements and a substantial investment in capital upgrades.

NYCHA decided to employ multiple large-scale Energy Performance Contracts (EPC) through the U.S. Department of Housing and Urban Development (HUD) to kick-start investment in energy efficiency and carbon reduction while developing a long-term strategy for energy-smart capital investments. These EPCs feature a non-traditional scope of work focused on eliminating overheating in as many master-planned developments as possible.

### ORGANIZATION TYPE

Public Housing Authority

### BARRIER

Aging mid-century portfolio receives limited funding each year to address its deferred capital improvement needs

### SOLUTION

Maximize energy savings in the short-term through a targeted, non-traditional scope of work for HUD Energy Performance Contracts

### OUTCOME

Increased energy savings of Energy Performance Contracts from 8% to 18%

## POLICIES

In 2016, NYCHA released the NextGeneration NYCHA Sustainability Agenda, a sustainability roadmap for the housing authority's 10-year strategic plan to better serve today's residents while preserving public housing for future generations. Among its 17 strategies, the Sustainability Agenda includes a commitment to raise \$300 million in private financing for EPCs to serve all master-planned developments.

HUD's EPC program offers housing authorities an opportunity to invest in capital upgrades without using their limited HUD Capital Fund dollars. In these instances, the EPCs are privately financed, using a forward commitment of the housing authority's operating subsidies equivalent to the utility cost reductions resulting from the work.

Master-planned developments make up 87 percent of NYCHA apartments, which typically house about 2,700 residents each. The median energy use intensity (EUI) in NYCHA's master-planned developments is 40 percent higher than the median EUI of multifamily buildings in New York.

NYCHA developed the following policies to maximize the effectiveness of its EPCs:

- **Required EPCs to maximize modernization of heating system controls in steam-heated buildings to eliminate overheating.** Like most mid-century New York City buildings, most NYCHA buildings are heated by steam systems with controls that deliver heat when triggered by outside temperatures. The lack of indoor temperature feedback results in buildings where many apartments receive too much heat while some apartments receive too little. Modernizing heating controls eliminates overheating.
- **Required EPCs to minimize costly replacement of boiler plants.** To ensure that modernizing controls reaches as many developments as possible, NYCHA chose to limit high-cost measures such as full boiler plant replacements, which can be funded by other capital programs.
- **Encouraged EPCs to pilot new technologies.** Because of the large scale of these EPCs, NYCHA encouraged Energy Service Companies (ESCOs) to propose and pursue pilot installations of new technologies. You can review one such example in the Better Buildings Solution Center where NYCHA's 344 East 28th Street property is showcased.

## PROCESS

**Energy Performance Contracts:** Under HUD's program, EPCs typically take two years of pre-construction planning, followed by up to 30 months of construction. NYCHA procured ESCOs through two large RFPs, opening up 147 developments for energy efficiency improvements through EPCs. To ensure smooth review and approval of the planned EPCs, NYCHA, HUD's NYC regional office, the HUD Energy Center, and the NYC Office of the Deputy Mayor for Housing and Economic

Development initiated a series of bi-weekly conference calls to create strong working relationships and clarify any gray areas in policy interpretation. These conference calls continued for the full two years of the initial EPCs' planning period.

**Energy Planning:** Based on more than seven years of benchmarking data and 20 years of pilot projects, NYCHA developed an early, rough model of greenhouse gas reductions for each energy conservation measure. These results were critical in establishing high-level parameters that have guided the scopes of work for each EPC. For example, the analysis revealed that more than 80 percent of the desired energy reduction would come through improvements in heating efficiency and domestic hot water efficiency. Because of the scale of the NYCHA portfolio and the long lead-times involved in capital projects, NYCHA determined that the most efficient use of its EPC program was to eliminate overheating by modernizing heating controls in steam-heated buildings.

**Capital Planning:** In parallel with EPCs, NYCHA convened an inter-departmental working group in 2017 to develop the capital investment policies that will guide future capital improvements of large boiler plants. The working group is comprised of senior staff members who oversee NYCHA's 5-year capital plan, design and engineering of all capital projects, and heating management. With the support and facilitation of a sustainability and energy-consulting firm, the working group is creating a development-by-development plan that sets performance goals by year and will set parameters for all heating and hot water-related capital work. The working group has already determined, for example, that all future boiler replacement work must propose a hot water solution that allows the steam heating plant to be turned off during the summer.

**External Partnerships:** Since the release of the NextGeneration NYCHA Sustainability Agenda, NYCHA has aggressively pursued external partnerships to bring new ideas and funding to its energy and sustainability projects. Investing in strong relationships with utilities, as well as state and city sister agencies, has delivered additional subsidies to supplement EPC funds, resulted in deeper EPC scopes of work, and provided unique opportunities to test new technologies, such as Passive House for existing multifamily buildings.

## OUTCOMES

As of October 2017, three EPCs serving 57 developments with a combined value of \$167 million have been approved by HUD.

Press releases:

- [Mayor de Blasio and HUD Secretary Castro Announce Nation's Largest Energy Savings Program for a Public Housing Authority Thursday, April 9, 2015](#)
- [NYCHA Announces First Ever Comprehensive Sustainability Agenda for Healthy & Energy-efficient Public Housing Thursday, April 21, 2016](#)
- [NYCHA Joins the NYC Carbon Challenge Thursday, February 2, 2017](#)
- [NYCHA Begins Work on the Largest Public Housing Energy Savings Program in the Nation Thursday, April 6, 2017](#)
- [NYCHA Announces Completion of New Lighting at 18 Developments in Brooklyn, Benefitting More Than 36,000 Residents Friday, June 2, 2017](#)

## MEASURING SUCCESS

NYCHA's goal is to eliminate overheating in all large steam-heated developments. To that end, one metric of success is achieving an average indoor temperature of 72-74 degrees at each building. Indoor temperatures are measured by the control system and recorded on off-site servers, enabling analysis over time and comparisons across buildings and developments. Likewise, the number of heating-related work order tickets should decrease over time as the heat is equally distributed and overheating complaints are minimized.

Each EPC has specific performance metrics tied to annual measurement and verification for the validation of subsidy payments. NYCHA follows and complies with all mandated measurement and verification requirements for HUD EPCs.

## TOOLS AND RESOURCES

- [HUD EPC review process](#) checklists, guidance, and sample documents for quantifying the savings resulting from energy-efficient equipment, water conservation, renewable energy, and cogeneration projects
- [Development of an EPC](#) (HUD diagram of the EPC process)
- [24 CFR 990.185](#) Federal Regulations for a public housing authority to pursue an EPC
- [NextGeneration NYCHA Sustainability Agenda](#) - sustainability roadmap for the housing authority's 10-year strategic plan

# Next Generation NYCHA



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