

LOOKING OUT

**LISC New York City's Holistic Approach to the
Multifamily Weatherization Assistance Program**

LISC
New York City

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1 EXECUTIVE SUMMARY

The Program

The spiraling costs of energy and water in New York City threaten the long-term financial viability of quality affordable housing. To combat this challenge, LISC New York City partnered with Enterprise Community Partners to create a holistic approach to undertake energy, water and indoor air quality upgrades.

Between 2010 and 2012 Community Weatherization Partners LLC (CWP), a joint venture between LISC and Enterprise Community Partners, oversaw an ambitious and successful program that weatherized 2,226 apartments in 96 multi-family affordable housing buildings in New York City. Through the New York State's Weatherization Assistance Program, the New York State Homes and Community Renewal provided \$15 million in American Recovery and Reinvestment Act (ARRA) funds and CWP leveraged \$2 million of NYC Department of Housing and Preservation (HPD) HOME funds, \$1 million in property owner matches required by federal WAP program guidelines and \$800,000 in Con Edison incentives and private funds for a total investment of \$18.8 million. The buildings ranged in size from four to 29 stories; 82% of the buildings were between five and eight stories. Federal program regulations required that eligible buildings be occupied by tenants with incomes at or below 60 percent of the State Median Income, equivalent to an annual household income of \$49,584 for a family of four.

Each building underwent an energy audit, which identified the needed energy saving measures within the \$6,500 per unit limit. The most common repairs:

- Heating System Replacement
- Heating System Controls
- Lighting
- Refrigerators
- Roof Insulation
- Smoke Alarm/Carbon Monoxide Detector
- Showerheads and Faucet Aerators
- Ventilation
- Weatherstripping/Air Sealing
- Window Replacement

Owners also received:

- support in "benchmarking" properties to document energy and water use;
- post-retrofit audits (post-weatherization commissioning) to ensure systems functioned properly; and
- training for owners, building maintenance staff and residents.

The Results

The program achieved an overall energy usage and cost savings of 15%. Savings varied by use, with the greatest energy reduction in heating energy use. The savings below reflect one year of energy use after completion of weatherization.



Energy Usage Savings



*Non-seasonal electric includes lights, appliances, ventilation and other year-round electric equipment.

**Heating and cooling energy consumption amounts are weather normalized.

In addition to energy savings, CWP realized the following results:

- Reduced utility bills for low-income families by at least \$20 per month.
- Created 193 green building jobs.
- Hired seven minority or woman owned businesses.
- Conducted post-retrofit audits (“post-commissioning”) for all 96 buildings.
- Provided door-to-door resident outreach in 85% of apartments on healthy living, reducing utility expenses, energy conservation, and water conservation.
- Installed measures to improve indoor air quality in 94% of apartments
- Trained 38 operations and maintenance staff, using the Building Performance Institute’s Energy Efficient Building Operator Certification Course and one-on-one training at each building during the post-commissioning process.
- Created customized green and healthy operations and maintenance training modules that incorporated checklists for in-class and in-field reference.
- Built effective partnerships with contractors, energy consulting firms, city and state programs, and our community development corporation partners.
- Provided program and fiscal management, quality assurance during production, and ensured the successful completion of the weatherization projects.
- Coordinated funding and program incentives to leverage federal Weatherization, other energy funding, and capital improvements.

This report includes key lessons learned and recommendations for affordable housing intermediaries; energy efficiency programs; and city, state, and federal agencies.

Lessons Learned & Recommendations



Building energy and water performance data provides owners critical tools to target upgrades and to track ongoing performance. Benchmarking should be a requirement in all energy upgrade and renovation programs and be used to assess properties prior to acquisition, during predevelopment or construction loan funding and as part of asset management.



Streamlining the weatherization eligibility process can increase program participation and focus owner resources on implementation. Create a process to efficiently co-qualify buildings and tenants for WAP services when such owners and tenants enroll and qualify for other low income programs with equivalent income criteria (e.g., HUD rental assistance programs, Low Income Housing Tax Credit, Supplemental Nutrition Assistance Program, Home Energy Assistance Program and Supplemental Security Income).



Improved oversight of contractors, commissioning, standardization of auditing practices and an expanded pool of qualified contractors are needed to ensure that efficient and high quality work is performed. A standard audit protocol should be created to expand the pool of pre-qualified contractors offering consistent assessments. Require commissioning for all energy upgrade programs to ensure systems function as designed.



Resident training reinforces key behavioral changes. Resident training should be an essential element of energy upgrade programs.



Successful integration of health and safety improvements into weatherization work requires heightened attention. Financial and technical resources should be identified to help owners address health and safety issues that result in deferral of weatherization work or that can be addressed during weatherization and in ongoing property management. LISC's NYC's: *Green and Healthy Property Management Guide* and *Two Shades of Green initiative* are resources.



Additional capital resources, improved coordination between green retrofit funding and housing rehab funds and technical expertise to help owners navigate these funding resources are needed. Affordable housing owners need a menu of retrofit financing options to meet varying needs. LISC and others should develop creative financing mechanisms, in addition to WAP, to lower operating costs and improve the long-term stability and efficiency of existing multifamily affordable housing stock. Green and healthy planning grants paired with predevelopment loans prior to an anticipated project refinancing and/or rehabilitation could support integration of energy efficiency, water conservation and health measures into construction planning and design. Housing funders could incorporate standards to use reserve funds to implement green and healthy retrofits.

The full report provides greater detail on CWP activities and results and a more thorough discussion of lessons learned and recommendations.

Acknowledgement of Funders & Partners

LISC NYC appreciates the generous support that made our holistic approach to weatherization program possible: The BTMU Foundation, Inc., Citi Foundation, Con Edison and Morgan Stanley.

Our Community Development Corporation (CDC) partners were essential to our CWP program success. CDCs are LISC New York City's core partners and recipients of our financial and technical assistance. Over the past 30 years, in partnership with LISC New York City, CDCs have developed and preserved over 30,000 units of quality affordable housing. CDCs also serve as a vital link between low- and middle-income families and critical services, and support comprehensive community development that actively involves local residents.

Our CDC partners (Banana Kelly, Belmont Arthur, Bridge Street Development Corporation, Dougert CDA, Northeast Brooklyn Housing Development Corporation, Promesa, Pratt Area Community Council, St. Nicks Alliance and West Harlem Group Assistance) supplied the pipeline of affordable housing buildings for weatherization work, assisted with property intake and verifying tenant income eligibility at each property, helped secure capital contribution from project reserves or other funding sources and ensured that property management and building staff received training and monitored buildings post-construction to make sure intended savings were realized. We are extremely grateful for the continued partnership with our CDC partners.

We are tremendously grateful for the organizations that helped make Community Weatherization Partners a success. These include: Enterprise Communities, New York State Homes & Community Renewal, New York City Department of Housing Preservation and Development, U.S. Department of Energy, Bright Power and Steven Winter Associates, Inc. We thank all the contractors that worked diligently on this

program. We would also like to thank the long time weatherization providers in New York State that assisted us as we developed our program.

Staff

A thank you goes to the LISC, Community Weatherization Partners and National Equity Fund staff and LISC NYC's Local Advisory Committee that contributed to this work and report: Denise Scott, Lillyanne Alexander, Jessica Boykin, Lisa Deller, Wilber Gonzalez, Kristy Greer, Jessica Guilfooy, Sophia Coquillette Koven, Michael Levine, Richard Mason, Elizabeth Pereyra, Sean Robin, David Rozan, Arturo Suarez and Kuza Woodard.

Partners

- Enterprise Communities
- NY State Homes & Community Renewal
- NYC Department of Housing Preservation and Development
- U.S. Department of Energy
- Bright Power
- Steven Winter Associates, Inc.
- Banana Kelly
- Belmont Arthur
- Bridge Street Development Corporation
- Dougert CDA
- Northeast Brooklyn Housing Development Corporation
- Promesa
- Pratt Area Community Council
- St. Nicks Alliance
- West Harlem Group Assistance

About LISC New York City

LISC New York City is dedicated to helping low-income New York City neighborhoods become healthy communities of choice – good places to live, do business, work and raise families. LISC has over thirty years of experience developing the infrastructure of community-based organizations by providing technical and financial assistance; building capacity of local institutions to respond to changing community needs; sharing best practices to maximize precious resources; and brokering collaboration among its vast network

of partners—government, nonprofit, and corporate—to tackle issues on the community level. Over the last 30 years, LISC New York City has invested approximately \$2.1 billion in more than 75 New York City community development corporations (CDCs) and other local groups. With our support, these organizations have developed 33,343 affordable homes and apartments and more than 2 million sq. ft. of commercial space. www.lisc.org/nyc/





2 THE NEEDS & CHALLENGES OF COMPREHENSIVE ENERGY & WATER EFFICIENCY UPGRADES

Why do owners and residents need to undertake energy and water upgrades and what is preventing this work from occurring? The needs and challenges are described below.



The more we can help owners lower operational costs, the better able they are to keep rents affordable for low-income families and maintain a healthy building environment.

—Denise Scott, Executive Vice President for Programs LISC National

Owners Want to Control Increasing Energy and Water Costs

NYC energy and water costs have significantly outpaced the 3% projected annual increase for the LISC portfolio. For example, over the past five years, New York City water and sewer rates have increased on average 12% per year. The National Equity Fund, an affiliate of LISC, has seen its New York Equity Fund portfolio water and sewer expenses increase by 59% from 2008 to 2012. These unanticipated increases in operating costs put a tremendous strain on the financial health of housing for low- and moderate income families, posing a threat to the long-term affordability of the properties and reducing cash flow that otherwise could have funded necessary repairs.



Given the escalating price of energy and water, the CWP weatherization program has provided a model of collaboration among federal, state and local government and affordable housing providers. The program enabled our Low Income Housing Tax Credit (LIHTC) projects to benefit from energy conservation measures, which they would have otherwise been hard pressed to afford. This was an important step forward in connecting financial and environmental sustainability in affordable housing.

—Lisa Deller, Vice President, Asset Management at National Equity Fund

Residents Want to Control Their Energy Bills

Low-income households typically spend 14 percent of their total income on energy costs compared with 3.5 percent for other households (<http://www.dnr.mo.gov/energy/weatherization/wx.htm>). Improving energy-efficiency in tenant apartments where they pay electric costs provides financial relief to low-income families, allowing them to meet basic needs such as rent, mortgage payments, and food.

Owners and Residents Want to Create Healthier Living Environments

LISC's mission is to "help community residents transform distressed neighborhoods into healthy and sustainable communities." Residents in lower income NYC neighborhoods are 2-3 times more likely to have asthma than residents in moderate or higher income neighborhoods ([NYC Environmental Health Tracking Portal](#)). Nearly six million households live with moderate to severe physical housing problems, which place them at-risk for illnesses and injuries including asthma, lead poisoning, slips and falls, and respiratory illnesses (American Housing Survey, 2009). Energy efficiency retrofits can improve overall health, reduce asthma triggers, reduce sinus infections and other respiratory problems, and improve home safety (Tohn & Wilson, (2012); Sundell, et al. (2011), Bornehag, et al. (2005).

Owners Want Greater Access to Retrofit Funding

Financial resources to undertake energy and water upgrades in multifamily buildings are often difficult to secure because owners are unfamiliar with the ever changing utility or energy programs and/or are not able to take on additional debt, partially due to lender and owner concerns that projected cost savings will go unrealized.



LISC was instrumental in helping us to navigate available energy upgrade resources. The result is that our buildings are in better shape, our tenants have lower bills, and we now have greater capacity and knowledge about available resources and how to manage these types of projects.

—Harry DeRienzo, President of Banana Kelly Community Improvement Association, Inc, CWP CDC partner

Owners Need Added Organizational Capacity To Manage Energy and Water Upgrades

Retrofits require specialized skills and knowledge. Without knowledgeable staff it can be difficult to secure funding (often merging multiple funding streams), manage complex upgrade projects, and infuse ongoing property management with efficiency strategies, particularly in cases where new technology is installed as part of an energy efficient retrofit.

Residents Need to Understand Their Role in Implementing Effective Energy and Water Conservation Strategies

Residents play a key role in the ongoing success of energy and water saving measures. For example, even with new water conservation measures installed in an apartment, a resident may fail to report a leaking toilet or leave their kitchen faucet running.

Residents Need Jobs

Job creation is one of the top priorities in New York City. Investments in energy-efficiency retrofits and other green industries create jobs right in the low-income neighborhoods where they are most needed. For example, New York State's energy efficiency program, Green Jobs New York, is creating 60,000 green jobs. The work of energy and water retrofits requires a workforce to complete a wide range of repairs; some of these require specialized technical expertise with mechanical equipment, while other common upgrades can be conducted with a trained contracting workforce. These job opportunities include: energy auditors, operating engineers and construction equipment operators and maintenance and repair workers.



We believe federal and other dollars can work together to address not only the energy efficiency of buildings but also their financial sustainability, resident health and safety, and expanding workforce development skills.

—Richard Manson, LISC Regional Vice President in the Northeast





3 THE WAP WORK — WHAT WAS DONE

In early 2010, Community Weatherization Partners LLC (CWP), a joint venture between LISC and Enterprise Community Partners, entered into a \$15 million Weatherization Assistance Program (WAP) contract with New York State Homes and Community Renewal (HCR) to improve the energy efficiency of properties in New York City created and preserved under Mayor Michael R. Bloomberg's New Housing Marketplace Plan. The program was also run in partnership with NYC's Department of Housing Preservation and Development (HPD).

WAP contracted with HCR to weatherize 2,226 apartments in 96 multi-family affordable housing buildings, using funding provided by the American Recovery and Reinvestment Act (ARRA). The buildings ranged in size from four to 29 stories; 82% of the buildings were between five and eight stories high. Working closely with the HPD, CWP was able to leverage \$2 million of NYC HPD's HOME funds, \$1 million in property owner matches required by federal WAP program guidelines and \$800,000 in Con Edison incentives and private funds for a total investment of \$18.8 million to weatherize the buildings. CWP completed the contract in early 2012.

CWP was part of the New York State Weatherization Assistance Program, the largest residential energy conservation program in the country. The program receives funding from the U.S. Department of Energy. Enterprise and LISC were jointly selected by HCR. The U.S. Department of Energy (DOE) initiated

the program and received additional funding through the American Reinvestment and Recovery Act (ARRA), \$394.6 million of which was allocated to New York State.

Weatherization funds were available to buildings created through various HPD programs that were in need of improvements to upgrade building systems and improve energy efficiency. Federal program regulations required that eligible buildings be occupied by tenants with incomes at or below 60% of the State Median Income, equivalent to an annual household income of \$49,584 for a family of four.

A technical professional, following an energy audit of the property, developed the weatherization scope of work. The maximum amount of assistance was limited to \$6,500 per unit. The typical scope of work included:

- new energy efficient boilers and hot water heaters;
- more efficient heating and hot water controls;
- water-conserving fixtures;
- ventilation upgrades to improve indoor air quality;
- roof insulation;
- air sealing;
- EnergyStar light fixtures, lighting controls and refrigerators;
- cleaning and tuning of boiler systems; and
- window repairs or replacements.



CWP implemented and managed the WAP Program and made important enhancements critical to the program's success to ensure that intended health, economic and environmental benefits would be achieved. These included:

- documenting the financial benefits of weatherization to influence funding programs and policy;
- better coordination of work to enable minimal disruption to the tenants;
- active resident engagement;
- post-construction monitoring to make sure that the intended savings were realized; and
- training property management staff on energy and water saving procedures.

Portfolio Targeting

Our streamlined services allowed affordable housing owners to place multiple buildings in their portfolio through the program qualification and retrofit process. Placing a high priority on minimizing bureaucracy and associated transaction costs for our CDC partners increased program enrollment and gave affordable housing owners fewer reasons to decide not to pursue

these building improvements. We also trained each affordable housing owner on the various components of weatherization work, including the initial energy data collection, tenant income eligibility documentation, scopes of work and construction timelines.

Working with HPD, CWP pinpointed owners with large portfolios of publically subsidized, aging tax credit financed or financially overleveraged, privately-owned buildings at risk of deterioration and foreclosure. The portfolio included buildings in Manhattan, Brooklyn, Queens and the Bronx. These buildings were targeted to improve the financial health and preserve the long-term affordability of the City's multi-family housing stock. Additionally, many buildings suffered from deteriorating structures, leaky plumbing, inadequate fresh air, moisture and mold that can lead to a range of health problems including injuries, allergies, asthma and other respiratory problems, and lead poisoning. This portfolio approach helped CWP build the green financing and project management skill set of our CDC partners. Partners are now using these skills to ensure that other buildings outside of our WAP pipeline receive energy efficiency and water retrofits in the future.



Leveraged Resources and Combined Incentives

Working closely with the HPD, CWP was able to leverage \$2 million of HPD's HOME funds, \$1 million in property owner's match and \$800,000 in Con Edison incentives and private funds for a total investment of \$18.8 million to weatherize the buildings. HPD also allowed properties that had reached the end of their Low Income Housing Tax Credit affordability period ("Year 15") to access reserve funds for the owner's match via a streamlined review process. In addition, CWP worked with Con Edison's Multi-Family Energy Program to install free low cost electric and gas energy-saving devices and EnergyStar refrigerators inside individual units.

Customized Building Staff Training and Resident Engagement

CWP also trained the building operators and maintenance staff on energy efficient operation and green management of the installed equipment. The classes covered the Building Performance Institute's Energy Efficient Building Operator

Training (EEBOT) curriculum; energy efficiency, health & safety, and sustainability; and provided a forum for robust and sometimes heated discussions of building management and maintenance issues. **Participating superintendents got to talk about their day-to-day tasks and challenges, and received tips and "take-aways" to make those tasks simpler, safer, and more likely to lead to an efficient building.** Building maintenance staffs are an integral part of the weatherization program; after retrofits are installed, it is up to the superintendent to take care of the property on an ongoing basis, conducting regular and preventative maintenance and responding to tenant concerns.

Encouraging positive tenant behavior is essential to support lower utility and maintenance costs and maximize the environmental and health benefits of green affordable housing. **CWP integrated door-to-door tenant outreach into the weatherization process, accessing 85 percent of resident households.** The resident outreach field staff were trained to use devices to test for carbon monoxide and gas levels in apartments during the pre and post air quality assessment intake process and conducted tenant education in concert with this testing.

Post-Weatherization Quality Control and Data-Gathering Program

CWP developed a post-weatherization quality-control and data-gathering program to track the ongoing performance of the buildings that received energy efficient retrofits via WAP. The program had three main components:

Benchmarking and Tracking

LISC NYC enrolled the weatherized buildings in an online data tracking system, called EnergyScoreCards (ESC), which enables both LISC NYC and our partner CDCs to track the ongoing building performance. Initial energy audits were performed on each building prior to weatherization to determine the scope of work that would be most cost-effective. By comparing data pre- and post-weatherization, researching the nature of performance differentials among the buildings and assessing the performance of buildings vis-à-vis weatherized buildings in NYC, we are able to generate valuable conclusions about which weatherization measures are most effective, and information in real-time that we can use to ensure realized savings are maximized.

Post-Completion Commissioning

Minimizing the incidence of improper operation is critical in getting the most value out of weatherization. Commissioning can reduce a building's energy use by an average of five to 15%. The program visited every weatherized building and showed building staffs how to optimize the mechanical systems. The site visits were performed by Steven Winters Associates (SWA), a leading firm for energy efficiency solutions, and took place during the 2012 heating season following construction completion. During the visit, a building assessment was performed with the original audit to compare pre- and post-weatherization conditions. A series of tests were conducted and controls recalibrated to ensure targeted performance. A diagnostic second round of site visits were conducted at the 10 poorest performing buildings assessed through EnergyScoreCards. Finally, a building-specific report with conclusions and recommendations for optimizing energy usage was issued.

Community Development Corporation Staff Training

LISC provided a customized, in-depth training for 25 CDC staff members and building operators on how to organize energy and water usage data, support financial planning for energy improvements and track the progress and success of energy and water-saving efforts.

Jobs Created

CWP's work generated 193 employment opportunities in the green economy. CWP served as a connector between green jobs training programs and a dependable development pipeline. Given our position as the WAP administrator, LISC had knowledge of upcoming work schedules, contractors qualified to conduct the work and the number of job placement opportunities available. Through a New York City sponsored and subsidized weatherization training program, CWP hired five trained workers through Brooklyn Workforce Innovations Building Works pre-apprenticeship program to conduct air quality testing on all weatherized units.





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4 THE RESULTS

Over the course of two years, LISC and Enterprise deployed \$15 million to weatherize 2,226 apartments—reaching 84 homes (4 percent) more than the original contract goal, due to program efficiency and economies of scale. The total direct investment of \$15 million leveraged another \$3.8 million in city and private funds, creating 193 green construction jobs.

Total CWP Pipeline

- 96 affordable housing properties received energy efficiency, water conservation and healthy and safety retrofits
- 2,226 affordable apartments with reduced energy and water use
- 84 more homes weatherized beyond original contract goal, with no added funding
- \$15,000,000 in ARRA funds deployed
- \$3,800,000 in city and private funds leveraged
- 193 green construction jobs created
- 1,892 (83% of apartments) apartment residents trained on green and healthy living
- 7 minority or woman owned contractors hired

Highlights from LISC Buildings

60 affordable housing properties were weatherized and received post-retrofit audits (post-commissioning)

1,033 affordable apartments with reduced energy and water use

25 affordable housing owners and building staff trained on green and healthy maintenance practices

60 buildings using online benchmarking and tracking system

94 percent of apartments received measures to improve indoor air quality

Energy Savings

The program achieved an overall energy usage and cost savings of 15%. These savings reflect one year of energy use after completion of weatherization; savings varied by use.



Energy Usage Savings



*Non-seasonal electric includes lights, appliances, ventilation and other year-round electric equipment.

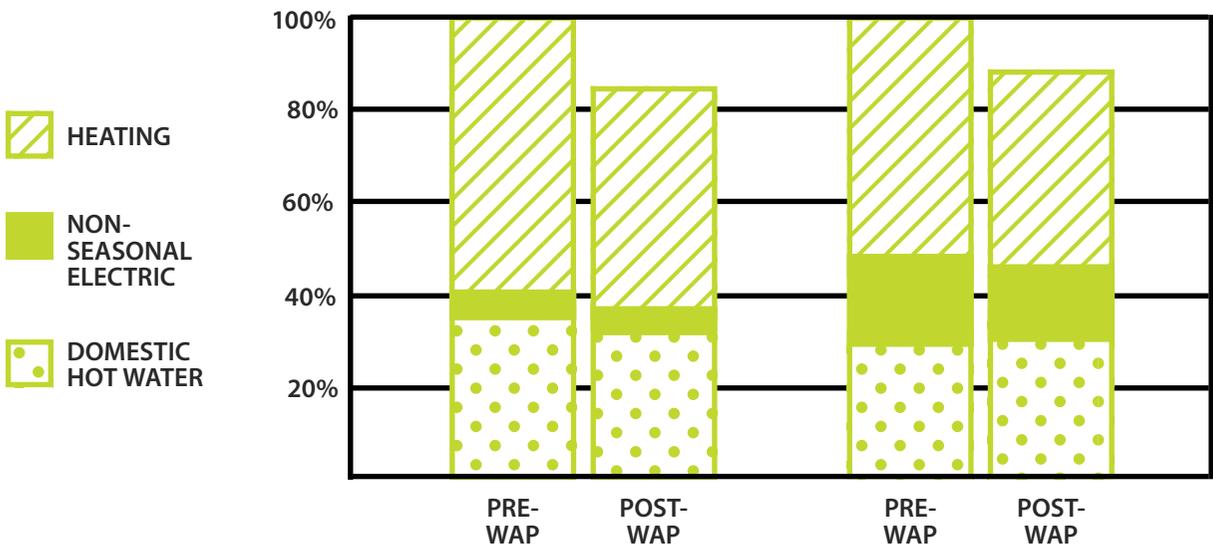


Energy Cost Savings



Energy Usage (by end use)

Energy Cost (by end use)



10 Most Common Weatherization Repairs

WEATHERIZATION MEASURES TAKEN	% BUILDINGS REPAIRED
Lighting	100%
Smoke Alarm/CO Detector	94%
Refrigerators	81%
Shower Heads	77%
Faucet Aerators	76%
Ventilation	74%
Weatherstripping	71%
Roof Insulation	49%
Window Replacements	45%
Heating System Replacements	40%
Heat Controls	18%

Improved Property Owners', Managers' and Building Staff's Technical Capacity

Beyond the mechanical repairs and energy upgrades to the building structure, the program trained building owners, managers and staff on their role in maintaining a green and healthy building. It is important that property owners, managers and building staff work together and understand how their respective actions can lead to higher or lower energy and water usage and improve health outcomes. Activities to monitor green and healthy practices are most effectively linked to existing activities like annual financial reviews and capital planning, which is why it is so important that green and healthy practices are integrated with existing management practices.

Maintenance personnel typically learn on the job and do not have many opportunities to update their skills to manage new systems and learn about critical maintenance strategies from experts, which is particularly important as equipment becomes more complex.



The training was particularly helpful for our staff in the Bronx because it emphasized the importance of regularly checking the “little things” like checking boiler control settings, ensuring all roof exhaust fans are operational and maintaining heat distribution pumps to keep our buildings running efficiently. It’s our job to create safe and comfortable living environments. Our newer staff learned a lot and our experienced supers brushed up their skills.

—Neldo Angeles, Property Manager, Dougert Management



The trainer helped one of our most experienced Supers, Catherine Diaz, get a handle on a newly installed system and she was able to pass along her existing knowledge to other supers in our portfolio; now they know who to turn to when an issue arises. Building a competent and confident workforce to maintain new and retrofitted systems is key to supporting long-term sustainability of these buildings.

—Michael Wilhite, Director of Asset Management, NEBHDCo

Ensured Buildings Achieved Optimal Performance

The post-commissioning process helped resolve issues that occurred during the weatherization scope of work and also addressed problems that developed over the course of the building's life. If the systems, equipment and materials are not installed and operating as intended, the building will not perform optimally. Through post-commissioning we improved building systems performance, increased the life span of new and old equipment and reduced the need for repairs, all of which saves money and results in fewer resident comfort complaints.



Through our commissioning work we were able to ensure high quality installation of heating systems, making sure equipment was installed properly and could operate efficiently. This oversight function caught potential problems early in the process.

—Hamid Lekic, Mechanical Engineer, Steven Winters Associates

Spurred Continued Green and Healthy Upgrades in Affordable Housing Properties

Providing capacity building support to our CDC partners to guide buildings through program qualification and the retrofit process motivated many owners to seek green and healthy retrofits in other buildings in their portfolio. For example, our CDC partner St. Nicks Alliance transitioned two affordable apartment buildings from toxic cleaning supplies to green cleaning products—reducing chemical exposure for residents and lowering cleaning supply costs by 25%. St. Nicks Alliance will soon transition the rest of their 850 affordable housing apartments to green cleaning products.



My hands were always dry and irritated from the old products and now with our switch to green cleaning supplies, I don't have those side effects.

—Jimmy Lugo, Building Super with St. Nicks Alliance.



Not inhaling toxic fumes has improved my ability to breathe while at home in my apartment.

—Jimmy Lugo's daughter who lives in building

Improved Resident Awareness and Clarified Residents Needs

Through the door-to-door resident outreach, CWP educated residents about the changes they could make in day-to-day behaviors that would save energy and water, give them healthier living environments, reduce waste and recycle more. The content focused on small changes that residents can make, such as turning off faucets when brushing teeth, soaping up or washing dishes to conserve water, leaving shoes by the door to reduce indoor air pollution, or unplugging devices when not in use to reduce energy use.



The one-on-one resident engagement about specific and doable changes in behavior really made a difference. Being “green” became real for our families and also our building maintenance staff.

—Angie Herrera-Sanchez, Director of Asset & Property Management, St. Nicks Alliance

This intensive resident engagement also helped identify community health as a key challenge. Residents reported lack of access to fresh food, poor access to health care and preventive services, and limited opportunities for safe recreation and play as important concerns. As a result, LISC is piloting two community-based health programs.

LISC New York City is embarking on a new program, Communities for Healthy Food NYC which will expand access to healthy food in disadvantaged neighborhoods. This program will integrate healthy food strategies into every aspect of our neighborhood-based work - by partnering with CDC partners to incorporate programming, education and outreach into affordable housing buildings and community services; educate residents, housing staff and community service providers on nutrition, food preparation and overall health; and enable economic



development by bringing retail outlets and fostering urban markets and food related enterprises. Our CDC partners are: Cypress Hills Local Development Corporation, Northeast Brooklyn Housing Development Corporation, New Settlement Apartments and West Harlem Group Assistance, Inc. For more information: http://www.lisc.org/nyc/programs/green_and_healthy_neighborhoods/communities_for_healthy_food_nyc.php

National LISC recently launched a Community Health Initiative, which seeks to improve health outcomes in the low-income communities we serve by increasing opportunities for physical activity; improving access to affordable health care and preventive services; and promoting healthy eating through access to fresh, affordable food and nutrition education. For more information: <http://www.lisc.org/>





5 LESSONS LEARNED & RECOMMENDATIONS

The weatherization work undertaken by LISC and our partners revealed opportunities to improve access to high quality energy and green upgrades. The key lessons learned and the associated recommendations offer a road map to improved performance.



Comprehensive tracking of energy and water performance data provides owners critical tools to target upgrades and to track ongoing performance.

Energy and water benchmarking software can provide owners and managers with easily accessible data to target high consumption buildings for upgrades, track improvements post retrofits and identify unexpected energy and water problems. Such software, once up and running, can alert owners to problems before they manifest as significant budget drains or before they create building problems (e.g., water leaks). Access to building level energy and water use enabled the team to create long-range portfolio-wide plans, targeting properties with the greatest opportunities for savings. In some cases, there were utility-use issues that we were able to troubleshoot and easily investigate discrepancies in monthly financials. Benchmarking also spurs actions to decrease maintenance costs due to proactive stewardship of building energy and water. One key challenge is to designate and train staff to regularly review the benchmark data and report red flags to the property owner/manager. A further challenge is to measure health or comfort complaints to target maintenance and to track changes after the adoption of green and healthy practices.

Recommendations

- **Require benchmarking to collect, analyze, compare and display building utility use information pre and post retrofits. Provide support and funding to reduce barriers for high quality data collection, analysis and tracking. Create consistent data collection standards to ensure data collected using various software systems can be linked for broader analysis.**
- **Explore strategies to track changes in resident work orders related to building conditions pre and post upgrades (e.g., pests, heat or cold, moisture/mold, smoking or other odors).**



Streamlining the eligibility process for weatherization can increase program participation and focus owner resources on implementation.

The CWP program piloted an approach to directly income-qualified tenants of publicly assisted housing, which resulted in stronger participation from this housing stock, compared with traditional means for income qualifying tenants. Replicating and expanding a streamlined model could accelerate the NYC pre-qualification process and the national WAP pipeline, as well as other green upgrade programs targeted to affordable housing. Reducing the burden on owners to meet complicated intake and paperwork documentation expedites enrollment and allows owners to direct their staff resources towards implementation and quality control. The WAP requirement that property owners contribute to multifamily energy upgrade costs also created enrollment challenges for owners without sufficient funds to meet the match. The production and timing constraints of AARA WAP funding did not allow many owners to identify matching funds (e.g., HOME or Federal Home Loan Bank), many of which can be time consuming to secure.

Recommendations

- **Create a process to efficiently qualify buildings and tenants for WAP services when the building and tenant qualify for other low income programs with equivalent income criteria (e.g., HUD rental assistance programs, Low Income Housing Tax Credit, food stamps, Home Energy Assistance Program and Supplemental Security Income).** Conduct outreach to owners receiving these non-WAP funds to explain that buildings may qualify for weatherization services. For example, CWP created a partnership with NYC's Human Resources Administration/ Department of Social Services to share data and qualify people based on other programs they qualify for, such as the Supplemental Nutrition Assistance Program (SNAP) and public assistance.
- **Identify and streamline access to other city, state and federal affordable housing rehabilitation funds to satisfy the WAP required multi-family owner match.**
- **Streamline enrollment for non-WAP low-income energy upgrade programs, using the NYC WAP pre-qualification approach, to reduce transaction costs and improve outreach.** For example, pre-qualify owners and renters enrolled in the New York Home Energy Assistance Program (HEAP) for the NYSERDA EmPower program, which offers energy efficiency services.



Improved oversight of contractors, post-commissioning, standardization of auditing practices, and expanded pool of qualified contractors are needed to ensure that efficient and high quality work is performed.

The lack of a standard audit format and output made it difficult to compare audit results and has created challenges in analyzing program data. In some cases, less extensive audits did not reveal the full scope of issues, some of which were discovered during construction. The existing pool of WAP auditors did not allow LISC to access other highly qualified auditing firms that had not traditionally worked with the Weatherization Program, but had extensive multifamily expertise. Although the process for qualifying non traditional auditing firms was cumbersome, it resulted in a more robust and competitive pool of firms with more extensive experience that could offer comprehensive and high quality services.

The typical 10% retention fee was not sufficient to incentivize all energy upgrade contractors to “cross all the t’s and dot all the i’s”. Post-commissioning revealed adjustments needed for warrantee work and improperly installed stack thermometers, heating controls, and heating equipment. Over 60% of buildings needed additional cleaning and tuning of the domestic hot water system and pipe insulation; domestic hot water is the second largest energy use behind heating. This commissioning presented vital information. Training maintenance staff to monitor and use new boilers, as well as clean and tune the equipment, was critical to achieving maximum practical equipment efficiency and providing information for future capital and maintenance improvements.

Recommendations

- **Create a standard audit output and required audit activities to ensure assessments are conducted to identify the range of energy and water upgrade opportunities and related construction needs.**
- **Expand the pool of pre-qualified auditing firms to include companies that can perform the required audits and have strong multifamily expertise.**
- **Require post-completion commissioning for all major energy upgrades, which includes system testing for heating and hot water systems, lighting and ventilation, and training for owners and maintenance staff, which is included within the WAP budget.**
- **Explore opportunities for cost savings through bulk purchasing of material (e.g., aerators, insulation and lighting).**

Common Weatherization Post-Commissioning Activities

Tune Equipment to Achieve
Maximum Efficiency

Address Improperly
Installed Equipment

Train Maintenance Staff



Resident training reinforces key behavioral changes.

Resident engagement helped to dispel myths that it requires enormous effort to conserve energy and water, reduce waste and recycle. Even though cost savings are usually the primary motivation for tenants, appealing to ideas promoting health, comfort, community and energy security attracted resident interest and engagement in maximizing the benefits of energy and water retrofit. The resident education program created green champions in each building that are continuing to engage residents to incorporate energy and water efficient practices into their daily lives.

Recommendations

- **Energy efficiency programs should include and disseminate tenant education materials that have been created in the last several years to explain the work completed and opportunities for added savings and health improvements through tenant actions.**



Integrating health and safety improvements into weatherization work requires heightened attention and support to owners.

The DOE funded weatherization program does allow a small portion of funding to be allocated to critical health and safety issues linked to the energy upgrade (e.g., minor moisture repairs, smoke and carbon monoxide detectors). These extensive energy upgrades create an opportunity to address health in a more comprehensive manner and to introduce owners, property managers, and residents to cost-effective strategies and practices to create healthier living environments (Integrated Pest Management, Smoke Free Housing, Green Cleaning) and encourage active living. The current *Two Shades of Green* program sponsored by LISC NYC, New York City Department of Health and Mental Hygiene and the NYC Coalition for a Smoke-Free City is working with numerous affordable housing owners to pursue such practices, including two CDCs that participated in the WAP program.

Recommendations

- **Identify financial and technical resources to help owners address health and safety issues resulting in deferral of weatherization work or that can be addressed along with weatherization work** (e.g., Integrated Pest Management to control pest problems, transitioning to green cleaning supplies to minimize use of toxic chemicals). Create a roadmap to help owners access such resources.



Improved coordination of WAP resources with existing affordable housing capital improvements funds would increase the pool of owners able to qualify for energy upgrade funds.

Roof leaks and other building deficiencies disqualified some owners from using WAP funding because there was insufficient reserve funding to support necessary larger capital repairs. As a result, grant funds that would help reduce operating expenses and increase reserves could not be accessed. WAP's restriction to not fund boiler replacement or other energy measures that do not meet the DOE Savings to Investment Ratio (SIR) prevented owners from accessing resources to replace equipment that had outlived its useful life with more energy efficient equipment.

Energy efficiency financing tends to operate under different parameters from housing financing, even where the capital works funded are identical. The time required to gather rehab funding and link it with a production program such as weatherization creates challenges. For example, Low Income Housing Tax Credit (LIHTC) properties that are reaching the end of the initial 15-year tax credit compliance period and are seeking to reposition represent one such opportunity to braid capital available to these properties with WAP funds. Intermediaries like LISC and state housing departments can help to facilitate packaging such funds to efficiently undertake capital repairs and energy upgrades to produce high performing and healthy housing.

Recommendations

- **Improve coordination of WAP resources with existing affordable housing rehab funds.** For example, New York State Homes and Community Renewal could leverage its expertise to integrate energy efficiency specifications into its broader array of affordable housing rehabilitation and preservation programs.

Over the past five years, energy-efficiency standards for LIHTC-financed housing construction have been upgraded as a result of requirements in the Qualified Allocation Plan; we see an opportunity to apply “green” standards to other housing programs.

- **Increase affordable housing financial institutions coordination of green retrofit funding and housing rehab funds.** For instance, HPD’s Year 15 Pilot Project is currently working to enroll a handful of Year 15 projects with [Con Edison’s Multi-Family Energy Efficiency Program](#) that offers a free energy survey, financial incentives for some energy efficient upgrades and replacing inefficient refrigerators and A/C units with Energy Star models and free in-unit measures which include low-flow showerheads and faucet aerators, smart strips and CFL light bulbs.





6 LISC'S GREEN AND HEALTHY PLATFORM

LISC is using our underwriting and asset management expertise, capacity, and national network to develop improved financing mechanisms and technical assistance to help owners access current resources to address high energy and water costs and health conditions. **The overall goal is to lower operating costs and improve the long-term stability and efficiency of existing multifamily affordable housing stock.**

- **Develop creative new energy retrofit financing mechanisms.** LISC tailors predevelopment, construction, and permanent financing solutions for owners pursuing energy retrofit. Recognizing that there are limited retrofit financing options available to owners outside of a major recapitalization event, LISC is developing innovative products to fill this hole. LISC has partnered with affordable housing owner Winn Companies to create a pilot program that will finance energy-efficient retrofits for low-income housing and allow property owners to pay for the upgrades through reduced energy costs. The program involves the creation of an “open-market” Energy Services Company (ESCO) that manages retrofit projects from start to finish and provides an energy savings guarantee to the property owner. The program received a \$5,250,000 grant from HUD’s Energy Innovation Fund (HUD EIF) to support its launch. We plan to use this initiative as a platform to craft energy retrofit financing solutions that can be delivered at scale nationally. www.openmarketesco.com

- **Help owners create healthier living environments, reduce energy and water use, and save money when managing properties.** Through its *Two Shades of Green* project, LISC, working with the NYC Department of Health and the NYC Coalition for a Smoke-Free City is offering technical assistance in this area. More information here: http://www.lisc.org/nyc/programs/green_and_healthy_neighborhoods/two_shades_of_green.php and our [LISC NYC’s Green and Healthy Property Management Guide](#).

- **Facilitate integration of sustainability considerations early in the design process.** LISC’s predevelopment loans and grants deliver essential early capital that allows owners to pursue holistic green retrofits, which weave green considerations into the fabric of the project from the start. We make a green planning grant and technical assistance available to accompany all our predevelopment and acquisition loans associated with multifamily rehabilitation projects. This package equips LISC’s partners with the tools they need to imbed green principles into project plans. For more information visit: <http://www.lisc.org/section/ourwork/national/housing>

- **Assist owners with packaging financial resources.** LISC helps owners achieve their property goals by providing advice on navigating financial and regulatory puzzles, and by assisting owners in securing financing sources. We also provide grants that enable organizations to build the internal capacity needed to take on retrofit projects.

- **Support the adoption of benchmarking as a proactive approach to asset management.** Through trainings and direct technical assistance on how to track and compare portfolio utility data, LISC helps owners and managers to sharpen their knowledge of their portfolios' needs and opportunities, positioning them to effectively prioritize between projects and achieve heightened energy savings through targeted retrofits.
 - **Assist affordable housing owners with portfolio-level planning.** Owners with strong track records in implementing retrofit projects may not know how to approach the task of portfolio-level planning. LISC assists owners in a) setting up data collection and tracking systems, and b) evaluating and comparing energy and water efficiency needs across a portfolio in order to identify priorities that can be translated into a portfolio capital plan.
 - **Incorporate standards to use reserve funds to implement green and healthy retrofits.** In some projects, operating and/or replacement reserves offer an important potential source for retrofit. LISC works with lenders and investors to establish standards for evaluating the appropriate use of project reserves to fund retrofit planning and capital work.
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