



ANCHORS IN RESILIENT COMMUNITIES (ARC)

Promoting Health, Wealth and Climate Resilience

ARC BRONX, NEW YORK A CASE STUDY

*Collaborative Projects of Emerald Cities Collaborative with
Health Care Without Harm and MIT CoLab*

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INTRODUCTION

This profile of the Bronx is part of an ongoing series of case studies and reports on Anchors In Resilient Communities (ARC). ARC initiatives are multi-stakeholder collaboratives of community organizations and coalitions, anchor institutions, foundations and government working at the intersection of community health, wealth and climate resilience. ARC's overarching mission is to increase the available social, financial and intellectual capital of low-income communities of color, as well as innovative projects for building their resilience. The community resilience frame addresses the legacy health and economic vulnerabilities of low-wealth communities, but also the new 21st Century's heightened family and community risks precipitated by climate change. The series of ARC reports, funded by The Kresge Foundation, highlight:

1. ARC Rationale and Background
2. Case Study #1: ARC East Bay San Francisco
3. Case Study #2: ARC Miami
4. Case Study #3: ARC Bronx
5. ARC: Lessons Learned (a primer, mostly for community organizations)
6. ARC: Best Practices in Community Engagement (a primer for health institutions)
7. Excerpt on ARC Miami and ARC Bronx from The Kresge Foundation's 2016 Annual Report

These initiatives are ongoing, long-term projects. Over time, the cumulative experiences and knowledge-creation builds a narrative of the promises, strategies and pitfalls of building anchor-community partnerships to advance intersectional climate resilience efforts. The goal is for anchor-community resilience collaboratives to become standard practice that can be replicated across the country.

ARC - BRONX, NY

Who and How

With funding from the Rockefeller Brothers Fund and the Kresge Foundation, the ARC initiative in the Bronx borough of New York City is led by the Bronx Community Development Initiative (BCDI) and Montefiore Medical Center, among greater New York's largest hospitals. BCDI members include community-based organizations (CBOs), anchor institutions, finance partners, elected officials and labor unions that work collectively to leverage anchor institutions' financial and political power to support community health- and wealth-building. They see energy and economic resilience as key opportunities for that work.

BCDI operates with support from Emerald Cities New York, Commonwise Education, a Bronx-based nonprofit organization, and the Massachusetts Institute of Technology Community Innovators Lab (MIT CoLab) – a center within MIT’s Department of Urban Studies and Planning focusing on innovation and development “from the margins.” CoLab has supported BCDI’s work with marginalized New York City communities for five years.

The Northwest Bronx Community and Clergy Coalition (NWBCCC), one of BCDI’s CBO members and another Bronx ARC initiative founder, is successfully developing meaningful, impactful community-anchor partnerships in the energy sector by collaborating with Montefiore to link energy efficiency upgrades in apartment buildings with building-wide asthma interventions for residents. BCDI has frequently engaged with Montefiore on economic development initiatives, including local purchasing.

BCDI also includes Green Worker Cooperatives, which is dedicated to incubating worker-owned green businesses; the Consortium for Worker Education, which has extensive experience in workforce development and education in the Bronx; and 1199SEIU United Healthcare Workers East, the nation’s largest local union (and the major community partner in ECC’s Miami ARC initiative).

Another major ARC development partner is BlocPower, an energy technology company connecting investors to institutional networks of energy efficiency projects in small businesses, houses of worship and nonprofits in underserved communities.

Despite the presence of these organizational and other valuable cultural, natural and built community assets – including numerous buildings suitable for rooftop solar installations and anchor institutions that could help generate local wealth and improve quality of life – decades of disinvestment, deliberate defunding of local planning capacity and structural racism in the Bronx have left residents with many social and economic challenges.

And while many anchor institutions are planning major investments in clean energy that will reduce energy costs, cut pollution and increase community resilience and health, these plans largely lack community involvement. This means an infusion of investment in clean, renewable and resilient energy may not ease the energy challenges facing Bronx residents, including affordability, vulnerability to outages during major storms and proximity to pollution from energy generation.

That is why ARC incorporates intentional and concerted action from community groups and balanced partnerships between communities and anchors to drive local economic development. This approach is also intended to achieve maximum community benefits from new energy technologies that are facilitating local control of energy production; adoption of clean and renewable energy; and increased resident involvement in decisions around public infrastructure

Partners

- Bronx Cooperative Bronx Cooperative Development Initiative (BCDI)
- Montefiore Medical Center
- Northwest Bronx Community and Clergy Coalition (NWBCCC)

What: Goals, Objectives

Even before ECC's involvement in the Bronx and partnership with BCDI, the latter had identified the health and energy sectors as areas of endeavor, due to their rapid growth and potential for local job opportunities and positive health and environmental outcomes. To those goals, ARC adds physical resilience and climate mitigation and adaptation.

To move towards these goals, the ARC project focuses on community development strategies to lower the respiratory effects of carbon and minimize climate-induced power disruptions. In addition, in an effort to increase community health and wealth through community-owned and supportive energy generation in the South Bronx, the project is exploring community energy districts in the Hunts Point food district and within a target community that encompasses Bronx public housing, Lebanon Hospital, Hostos Community College and the surrounding communities.

The initial phase of ARC in the Bronx included two distinct initiatives:

- Assessing the feasibility of a microgrid in the Hunts Point section of the South Bronx
- Promoting holistic community health in the Northwest Bronx via the Bronx Healthy Buildings Program, a cross-sector initiative to provide green building retrofits that address “upstream” causes of asthma-related emergency department (ED) visits and hospitalizations.

The rationale behind the second initiative is that it is very costly for asthma patients to repeatedly seek emergency care and/or be hospitalized because conditions in their buildings (and neighborhoods) are causing and/or triggering their asthma. Such outcomes are costly to the state in the case of Medicaid recipients, costly to the hospital in the case of uninsured patients and costly to insurance companies for those who are covered. There are also indirect costs to asthma patients themselves from missed school and work.

But if the money being spent on ED visits and hospitalizations is redirected to address upstream causes such as poor housing conditions, rather than simply to treat acute symptoms, overall costs can be reduced and health improved.

Climate Challenges and Risks

Informed by the experience from Superstorm Sandy – including the loss of power to 8.5 million customers due to failure of the electricity grid – a key strategic focus of the Bronx ARC program is strengthening energy resilience for vulnerable communities in the South Bronx.

Sandy's multi-day power disruption was significant across the region, but such consequences are a special concern for the South Bronx, a highly dense community that is home to several public housing developments, Bronx-Lebanon Hospital and the region's food distribution center in Hunts Point.

Following Sandy, area public housing residents were among the last to regain power. Residents in numerous high-rise apartment buildings were stranded without heat, lights and elevator service. They also went without water, which must be pumped to upper floors. Patients at Bronx-Lebanon Hospital faced critical health and safety threats, while the region's food distribution center located on industrial lands was beset by the loss of power and flooding.

South Bronx Microgrid

Microgrids are decentralized, and often small-scale, energy generation or storage facilities that can provide electricity to the primary grid or operate as self-contained power sources. Community-owned microgrids can build climate resilience and wealth in the Bronx in a number of ways:

- **Meeting environmental goals** – Generating electricity locally reduces energy losses during transmission and allows cogeneration, aka combined heat and power: capture of waste heat from electricity generation that can then be used to cool and heat buildings.
- **Reducing energy costs for residents and businesses** – By reducing transmission costs and introducing more efficient technologies, decentralized and often smaller-scale energy generation or storage facilities – known as distributed energy resources (DERs) or distributed generation (DG) – may offer lower-priced energy than traditional sources.
- **Creating a source of community wealth** – Community-owned energy infrastructure can generate income for community members and organizations that sell energy to utilities or directly to other consumers.
- **Increasing energy resilience and security** – By locating energy resources closer to consumers and reducing the length of transmission cables, DG is automatically more resilient than a traditional, centralized model. Coupled with the ability to switch to local DERs when the primary grid fails, a full-blown microgrid can further increase resilience during extreme weather events.

In such endeavors, anchor institutions are important partners, because they consume a lot of energy and often require consistent power even (or especially) in the event of emergency. They also hold many real estate and capital assets, which can be used to develop DERs.

Further, providing a local source of electricity would counter the drawbacks inherent in the current structure of New York State's electricity market:

- Transmitting electricity over long distances is inefficient, because energy losses along the way mean power plants have to create more electricity than is actually needed. This increases greenhouse gas emissions and increases electricity costs for consumers.
- Money spent on electricity is taken out of the local economy. Energy suppliers are private companies, and large investors own utilities like New York City's Con Edison. As they are unlikely to invest any of their profits in the local Bronx economy, money that Bronx consumers spend on electricity simply leaves the borough.
- This system is not resilient. A single stretch of damaged cable can affect large swaths of the grid, so every additional mile of transmission cables increases the system's vulnerability to extreme weather events or other disruptions.
- The grid requires significant infrastructure investments that cannot be recovered without significant increases in energy costs for consumers.

It should be noted that the New York Public Service Commission is moving the state towards a DER model through its Reforming the Energy Vision, or REV, initiative, under which the traditional utility grid would become a "smart grid" – an interconnected system of local energy generators and consumers that could communicate via technology and price signals to increase production and reduce demand during peak times.

How

Emerald Cities initially identified six broad phases for implementation of a community microgrid in the South Bronx:

1. Select a site that seems plausible for such an intervention.
2. Build the political, technical and community partnerships necessary for implementation.
3. Raise funds for and conduct a detailed feasibility study to determine specific equipment, potential savings and possible sources of financing.
4. Structure the deal to determine how the system will be financed, owned and operated.
5. Implement the community microgrid by securing loans and completing required construction.
6. Operate, maintain and reinvest in the microgrid going forward.

The project began by mapping major South Bronx institutions that could be potential microgrid sites, with the New York City Housing Authority (NYCHA) – the nation’s largest municipal public housing authority – quickly emerging as a strong option. In the Bronx alone, NYCHA owns 90 developments totaling 44,493 units of traditional public housing, which contribute to NYCHA’s very high power demand, particularly in summer months when many residents use energy-gobbling window air conditioners.

NYCHA currently receives all of its power from the New York Power Authority, and the U.S. Department of Housing and Urban Development reimburses its energy costs. Given that NYCHA provides housing to low-, very low- and extremely low-income households, reducing NYCHA’s energy costs clearly serves a public purpose and provides a strong moral argument for community ownership and control.

Hospitals are also a good fit. In the South Bronx, many NYCHA developments are located near major hospitals, meaning several sites could accommodate a NYCHA-hospital microgrid. Shared use of a single microgrid by NYCHA and the hospital would offset peaks or drops in usage at either institution and ensure a relatively consistent level of energy consumption.

With help from New York City Councilmember Ritchie Torres, who represents the 15th Council District in the Central Bronx and chairs the New York City Council Committee on Public Housing, ECC staff had several preliminary conversations with leaders of NYCHA’s energy department. They were enthusiastic about opportunities to explore community microgrids, and after partners signed a nondisclosure agreement, NYCHA shared energy consumption data for all of its Bronx developments. Emerald Cities analyzed these results with the help of the Pace University Climate and Energy Center. The analysis included mapping the developments to identify where energy interventions could have the biggest impact and screening for proximity to critical infrastructure.

Based on this analysis, Emerald Cities New York identified several developments for both energy efficiency upgrades and energy generation/microgrids. Two of the most promising:

- Patterson, which is across the street from Lincoln Medical Center and thus could help support a multi-stakeholder microgrid. It is also in a Hurricane Zone 4, indicating a need for resilient infrastructure.

- Morris I/Morris II/Morrisania, three developments that share a heating system, forming a single intervention site from an energy perspective and are adjacent to Bronx-Lebanon Hospital and near many other NYCHA developments.

Outcomes/Lessons Learned

The decision to pursue a community microgrid is as political as it is technical, especially for multi-stakeholder grids. The ARC team thought it could go right into selecting a site but soon realized the need to first educate and organize decision makers to create the relationships and institutional will needed to move forward. That said, external parties like ECC are well positioned to build relationships across multiple institutions.

Early and consistent organizing is needed to ensure true community input into the process and to head off foreseeable challenges during implementation, including:

- The difficulty of both structuring and retaining community ownership and control; and
- Threats to air quality resulting from oil- or gas-powered generation in dense urban areas.

For these reasons, it is crucial that organizations like ECC begin educating and organizing residents immediately around the vision of a microgrid. The South Bronx Community Resiliency Agenda, which is already convening residents around a microgrid in another part of the South Bronx (with support from Kresge) could be a partner in this.

Institutional decisions take a long time if we wait until institutions are ready. But the community can exert influence to hold anchors accountable to a vision of community resiliency.

Energy infrastructure is technical and often seems disconnected from residents' experiences.

We need community trainings that explain the energy system in approachable terms, connect community resilience to other issues that residents care about and build leadership so residents can refine and express their vision to anchors. The Climate Change & Health training developed by Emerald Cities can begin building local leadership in this emerging field.

The ARC early-stage partnership – based on BCDI's core tenet that ownership is key to self-determination and wealth creation, and that when residents are not making decisions for themselves they will suffer the ill effects of a system that is not designed with them in mind and from which others profit – may well evolve into the system's eventual governance structure. This means BCDI and its community partners must position themselves as decision makers from the beginning in order to drive the process and achieve the desired social outcomes.

The biggest overarching lesson is that adequate education and organizing are necessary precursors to site selection.

Challenges

Loss of institutional champions and allies. Anchor institutions typically have thousands of employees – NYCHA, for example, has over 11,000 – and it can be challenging to penetrate the layers of institutional bureaucracy. The ARC team was initially able to make contact with NYCHA through the community coalition’s relationship with New York City Councilmember Ritchie Torres, and we found a receptive audience.

But around the time the ARC team delivered its microgrid recommendation, an internal NYCHA reorganization resulted in the team’s internal contact being moved to another department, and NYCHA’s energy and sustainability department became much less receptive to the microgrid idea. When the conversation with NYCHA resumed, its representatives said several groups had approached them with similar ideas, and they requested significant upfront work – with no guarantee of a partnership down the line.

Need to coordinate with existing institutional capital plans and across multiple anchor institutions. Nearby Bronx-Lebanon and Lincoln Hospitals have their own capital plans, as do other potential sites throughout the South Bronx. The timing of these plans could make an investment in local energy generation opportune – or not at all viable. Ensuring coordination and finding potential alignment in capital programs across these multiple institutional actors is a key challenge of creating multi-stakeholder microgrids.

Difficulty accessing the data needed to make informed decisions about where to site a microgrid. Analyzing energy consumption data is one important first step in assessing the viability of a community microgrid; and even with NYCHA’s cooperation, partners had to overcome resistance to sharing energy consumption data. Detailed information about capital plans or financial documents will be even harder to access.

Next Steps

The initial investigation indicated that a community microgrid may not be feasible without significantly more funding, capacity and, crucially, anchor support. However, other community-owned energy models, like shared solar, can move forward without getting mired in the bureaucracy and capital planning processes of large anchor institutions.

New York State recently created regulations to make remote net metering and shared renewables – an energy system owned by multiple, offsite participants – viable for the Bronx. In that case, anchor institutions would still be potential hosts and financiers for community-owned energy systems, but they would not be directly responsible for implementing or taking energy from the system.

Next steps to pursue this sort of model include galvanizing tenants and residents around the vision of community-owned energy (using some materials from ECC’s Climate Change & Health curriculum); planning for the structure and location of such a system; and accessing new incentives and opportunities from the state and utilities to begin pursuing such models. We have begun working with The Point CDC and NWBCCC to investigate opportunities for popular education and shared solar across the Bronx.

Demographics and Health Risks

The Bronx has the lowest median income of New York City's five boroughs, is overwhelmingly populated by Medicaid-eligible working-poor people and has a high percentage of minority residents – all of which are risk factors for asthma. Poor housing conditions exacerbate this risk. More than 80 percent of Bronx residents are renters, meaning they often cannot directly address issues such as the aeroallergens and rodent infestations that are primary contributors to asthma. Their landlords, moreover, have little financial incentive to invest in building upgrades.

The ARC Bronx Healthy Buildings program is focusing on the Northwest and Central Bronx (ZIP codes 10452, 10453, 10457, 10458, 10460, 10462, 10467 and 10468) for three reasons:

- The high prevalence of asthma and asthma risk factors in these areas. Nearly a third of the roughly 170,000 residents of the 15th Council District in the Central Bronx are under 18 and at serious risk for asthma. As noted, tenants in these neighborhoods face some of the worst housing conditions in the city, including high rates of housing code violations.
- ARC partners NWBCCC and Councilmember Torres already work in these neighborhoods, allowing the project to leverage existing networks to ensure maximum impact.
- These communities are the closest to Montefiore Medical Center, so a large number of asthma patients visit Montefiore's emergency department. While this is a large geographic swath, ARC will target individual multifamily buildings that house a small target population to allow effective tracking of outcomes for those individuals.

Bronx Healthy Buildings Program

The Bronx Healthy Buildings Program (Healthy Buildings) is a cross-sector initiative to promote holistic community health by providing green and healthy building retrofits that will address upstream causes of asthma-related emergency department visits and hospitalizations in the Northwest Bronx. In addition to jointly addressing the root causes and triggers of asthma and ensuring a healthy Bronx, the partners share a vision of creating a borough where all stakeholders, including engaged and informed residents, strive for holistic community health. This involves investing in a safe built environment, high-road job creation, training for low-income residents and a healthcare delivery system that prevents health disparities before they emerge.

Another barrier to better health is the cost of care relative to income. An estimated 177,000 Bronx residents are uninsured, and, coupled with the high cost of housing (including energy consumption), their low incomes mean healthy lifestyle options that prevent disease are unaffordable. In addition, many residents are unaware of the role that housing conditions play in their family's health, and/or they lack the proper training to self-manage their asthma or other diseases.

In the larger context of intergenerational poverty and unemployment that lead to stress and instability, these barriers further exacerbate Bronx residents' poor health.

Who

Mirroring its multi-faceted approach, Healthy Buildings brings together a host of partners from CBOs, public agencies, healthcare providers and technical experts in building science. In addition to ECC, MIT CoLab, NWBCCC and BDCI, core partners include the New York City Department of Health and Mental Hygiene (DOHMH), Montefiore Medical Center and many others.

What: Goals, Objectives

The project, with its upstream and holistic nature, has various goals related to health, sustainability, leadership development and economic development. These include:

- **Reducing Asthma Severity/Improving Health**, measured by lowered rates of asthma-related emergency department visits and hospitalizations; other potential metrics include monitoring of indoor air quality.
- **Addressing Housing Issues** – Asthma triggers in the aging multifamily buildings that residents inhabit include pests (rats, cockroaches), mold, mildew and poor air quality, exacerbated by long waits for needed repairs and/or temporary fixes that do not address underlying problems.
- **Conserving Energy/Promoting Sustainability** – Many of these buildings must upgrade their boilers per New York City’s 2015 Clean Heat law. Buildings over 50,000 square feet must benchmark energy and water consumption annually and, every 10 years, identify no- and low-cost efficiency and performance improvements. The ARC project will help building operators meet or exceed these requirements and reduce overall carbon emissions.
- **Generating Financial Savings (for All Parties)** – The Healthy Buildings energy retrofits are an incentive for the landlords, who will incur savings on their utility bills and can invest the money saved in needed building upgrades. Indirectly, reduced resident turnover due to increased comfort and reduced medical bills will also generate landlord savings, as will avoided legal action from unmet tenant demands.

Partners

- MIT CoLab
 - MIT Department of Urban Studies & Planning
 - Northwest Bronx Community and Clergy Coalition (NWBCCC)
 - New York City Department of Health and Mental Hygiene (NOHMH)
 - Montefiore Medical Center
 - Bronx Cooperative Development Initiative
 - BlocPower
 - New York City Councilmember Ritchie Torres, Bronx District 15
 - New York Lawyers for the Public Interest
 - Enterprise Community Partners
- The Healthy Buildings team is coordinating with the following organizations to leverage their related programs:
- a.i.r. nyc
 - New York City Department of Housing Preservation and Development

Importantly, housing will remain affordable for current tenants despite the upgrades, thanks to regulatory agreements that put buildings into rent stabilization over a specified period. Landlords cannot file for major capital improvements (MCIs), which would allow them to raise stabilized rents beyond a set rate, as a result of the work funded or financed through Healthy Buildings.

In the long run, Healthy Buildings should yield a greater return on investment for hospitals than existing approaches that deal with poor health outcomes but do not address underlying root causes. Because of cost savings associated with reduced hospital visits, there are also benefits for health insurance companies and the federal Medicaid program. This upstream, holistic approach also supports the healthcare industry’s shift toward prevention and cost-cutting.

- **Creating Jobs and Wealth** – To support the local economy and create jobs for Bronx residents, Healthy Buildings encourages the use of local contractors who would be paid living wages and adhere to high-road workforce standards. The project also plans to explore the feasibility of Community Workforce Agreements (CWAs), modeled after ECC’s **RENEW program** in other cities. In Seattle, for example, a CWA establishes goals for work hours
- on energy efficiency retrofits to be performed by low-income women and people of color, as well as for utilization of apprenticeships. Additional job-creation potential exists through community health worker positions – part of the home-based asthma intervention program.
- **Developing Local Leadership** – The program also aims to educate and empower residents and local leaders to identify needs and work with – or pressure – landlords for change, shifting the balance of power and increasing adoption of such policies as smoke-free housing, mold prevention, pest management techniques, green cleaning and energy-saving measures. Leadership development will happen through the formation of tenant associations, trainings on tenants rights and specific content like green cleaning techniques, as well as on the social determinants of health, which will demonstrate the connections between social, environmental and economic factors and poor health outcomes.
- **Improving Community Health** – ARC Healthy Buildings will educate residents facing substandard housing conditions to identify needed repairs and empower them to hold landlords accountable for addressing the conditions that have contributed to an unhealthy living environment. The scope of interventions, from eliminating mold and pests and addressing poor ventilation and air quality to providing energy efficiency retrofits all have health-related benefits beyond improving respiratory health.

By participating in the program, tenants who are on Medicaid will, through Montefiore’s home-based asthma intervention program, have access to a community health worker who will provide individualized support to manage tenants’ asthma and mitigate triggers via integrated pest management (IPM), better trash removal and cleaning practices and elimination of mold and lead. By addressing needed upgrades and creating tenant associations, the project should also lead to better and more productive tenant-landlord relationships, ultimately improving related health conditions such as stress.

How

The Bronx Healthy Buildings Program consists of five major components:

1. Identifying target buildings
2. Outreach and organizing
3. Building analysis and baseline assessment
4. Capital improvement and home-based asthma intervention
5. Monitoring and evaluation

Identifying target buildings – Using electronic medical records from Montefiore Medical Center, partners have identified all multifamily buildings in the Northwest and Central Bronx with asthma patients who visited Montefiore between 2012 and 2015. Partners are currently working to secure additional electronic medical records for other healthcare providers across the borough through the Bronx Regional Health Information Organization (Bronx RHIO).

Outreach and organizing – For building owners and operators, the outreach team will primarily highlight the economic incentives of program participation:

- Future energy efficiency and water conservation savings
- Favorable financing options for building improvements
- Potential reduced tenant turnover due to residents being healthier, more comfortable and more satisfied with their housing
- Avoidance of litigation and penalties associated with the city’s Clean Heat Law, the Americans with Disabilities Act (ADA), building code and maintenance violations and tenant lawsuits

And as noted above, community organizers and community health workers will educate tenants on environmental triggers, asthma self-management, green cleaning and energy and water conservation, as well as on the social determinants of health. Additionally, residents will have the opportunity to learn about hospital community benefit requirements under the Affordable Care Act and New York State’s Medicaid reform process, enabling them to participate meaningfully in conversations on leveraging such investment in their communities. Another set of trainings will increase tenants’ awareness of their rights as renters and their sense of agency in addressing building-wide issues – core components of the Healthy Buildings Program.

Building analysis and baseline assessment – Provided that building owners/operators move ahead with the program, this stage will include a full building audit incorporating health, energy and general structural needs, as well as compilation of tenant-identified improvements and baseline information for monitoring and evaluation. The Healthy Buildings team will recommend that building owners/operators move forward with all impactful and cost-effective capital improvements identified by [Enterprise Community Partners’s](#) Healthy and Green Physical Needs Assessment and BlocPower’s in-house engineering team.

Home-based asthma interventions include:

- **Integrated pest management (IPM)** an approach focusing on long-term prevention by reducing food, water, access and places where pests hide. Modifications include replacing missing garbage lids, repairing leaky pipes and sealing cracks where pests can enter.
- Through a partnership with [a.i.r. \(asthma intervention and relief\) nyc](#), **community health workers** will educate tenants on asthma self-management practices, behavioral interventions and home environmental assessments; serve as liaisons between tenants and the healthcare system; and provide referrals for IPM.
- **Green cleaning training** will reduce building staff and resident exposure to toxic chemicals and other irritants. Healthy Buildings will provide resources and trainings to facilitate a transition to green cleaning products.

Monitoring and evaluation

The Healthy Buildings team plans to use the following evaluation metrics:

- **Electronic medical record (EMR) data** – The team will look at changes in healthcare utilization and costs over time (through pre- and post-intervention comparisons) and between properties (through intervention-control comparisons).
- **Pre- and post-intervention surveys** – A questionnaire administered before and after the intervention will measure changes in self-reported respiratory health and overall health, behaviors, education, conditions in the home and residents' sense of agency regarding their health and environment.
- **Energy savings** – This includes changes in electricity, oil, natural gas and water usage for the entire building (including tenant areas), as well as for areas for which only the building owner/operator is responsible.

As Healthy Buildings partners are committed to ensuring the most comprehensive and robust evaluation possible, the team is currently working to include the following additional evaluation metrics:

- **Indoor air quality monitoring**, which would show the impact on particulate matter, a major asthma cause and trigger.
- **Adherence** – Measuring asthma control by tracking inhaler use through electronic sensors.

Replication and scale

Once the Healthy Buildings model is proved successful, there is great opportunity for scaling the project in the Bronx and beyond and for making it financially sustainable through future consistent healthcare and public funding, as well as through self-generated revenue streams. In addition to investing Medicaid reform dollars in the short term, Montefiore and other nonprofit healthcare systems can utilize their community benefit dollars or pay-for-success models to strategically invest in upgrading community infrastructure and the root causes of poor health.

Outcomes/Lessons Learned: Success Elements

Cross-Sector Collaboration

The ARC partnership represents a true cross-sector collaboration among community organizations, healthcare providers, the Department of Health and other technical experts that understand the interconnection among social, economic and health issues. Through their collaboration, partners aim to create new paths of communication and coordination that can address health issues beyond asthma so the Bronx becomes a leader in innovative community health solutions.

Partnership with Montefiore Medical Center

The partnership with Montefiore has been particularly valuable. By treating the community as an equal partner and putting its needs at the forefront, it has shifted the traditional dynamic between hospital and community. The involvement and support of Dr. Marina Reznik, a physician and researcher focused on pediatric care and asthma, and Amanda Parsons, the hospital's vice president of community and population health, have put champions for the project within Montefiore's walls. Further, Montefiore's commitment to sharing EMR data has allowed for a data-driven project.

Leveraging Existing City Programs

Cross-sector collaboration has also meant leveraging New York City programs:

- The New York City Department of Health and Mental Hygiene’s (DOHMH) Healthy Homes initiative currently funds IPM and green cleaning training.
- The Primary Prevention Program, a joint program of DOHMH and the Department of Housing Preservation and Development (HPD), provides grants for lead remediation and other health improvements at low-income, multifamily buildings.
- HPD also provides forgivable, no-interest loans for energy efficiency and water conservation measures, as well as for general moderate rehabilitation at small- and medium-sized buildings.

Data-Driven Project

As noted, Healthy Buildings is a data-driven project that leverages EMRs to map repeat asthma patients’ residents in the Northwest Bronx. The project also looks at building condition to identify targets for the greatest impact. The project will leverage NWBCCC’s existing relationships with building owners and tenants to get greater participation and leadership development. This approach not only leads to greater buy-in from stakeholders, it also allows robust evaluation of project interventions to demonstrate success and scalability.

Additional elements of success:

- Having a community organization as the project lead has driven a more community-oriented, holistic and integrated intervention.
- Leveraging NWBCCC’s track record with successful community organizing, landlord relationships and sustainability (due to its experience with the federal Weatherization Assistance Program).
- Working with sophisticated community partners that recognize the value of collaborating with anchor institutions and using upstream approaches, rather than direct services, and who see the long-term connections among energy, health and wealth.

Outcomes/Lessons Learned: Challenges

Montefiore Partnership

While productive, the partnership with Montefiore was not without its challenges. To meet the required match to its \$250,000 BUILD Health award¹, the hospital committed to provide EMR data, research and program design support and to coordinate with Healthy Buildings partners on home-based asthma interventions at target buildings. Although leveraging Medicaid dollars to invest in Healthy Buildings is an innovative way of addressing the root causes of asthma severity and has great potential as a steady stream of future investment, the timeline of and participation in DSRIP’s asthma project is partly contingent on the state’s timeline for disbursing DSRIP funds.

¹ In summer 2015, NWBCCC received a \$250,000, two-year implementation grant from BUILD Health Challenge, a consortium of funders that seek to “identify, accelerate and spotlight best practice models and innovative approaches that reorient the field toward upstream factors that influence health.” The grant is primarily supporting organizing, partner coordination and program development. BUILD Health Challenge additionally provided \$2 million in low-interest loans and a \$2 million loan loss reserve for permanent financing, which BlocPower has successfully leveraged to create an \$8 million loan fund to finance construction.

In March 2016, Bronx Partners for Healthy Communities (BPHC), the coalition that includes Montefiore, launched a home-based asthma intervention program. Further alignment must occur to ensure that tenants who participate in Healthy Buildings will also be able to take advantage of this valuable resource.

Another challenge of working with Montefiore was not receiving the EMR data in a timely manner. Despite the success in developing a data use agreement between MIT and Montefiore to enable targeting of buildings with high numbers of residents with asthma, legal and ethical requirements around sharing such data and the need to navigate the related bureaucracy caused substantial delays in beginning the project in earnest.

Another challenge is that the hospital's internal champions for Healthy Buildings are not always able to be at the table; and it can be difficult to get needed information about processes like DSRIP, as well as access to decision makers who can deploy needed resources.

Fundraising

As mentioned above, the main source of funding for Healthy Buildings is from the BUILD Health implementation grant and Montefiore's in-kind match. Yet this multi-faceted project, with its many key components, has required additional fundraising to support outreach, organizing and evaluation.

In addition, financing predevelopment of building upgrades and repairs has been a particular challenge. While predevelopment expenses can be paid back through permanent construction loans as part of overall project costs, these expenses are difficult to finance up front, due to the risk that some building owners/operators will not move forward with retrofits. The Healthy Buildings team is currently working to develop instruments that can mitigate this issue, such as a loan loss reserve – accounting entries that banks make to cover estimated loan losses due to defaults and nonpayment.

Balancing Partner Interests and Perspectives

A final challenge to note is the need to balance project partners' various interests and perspectives while keeping the community's best interests front and center. The diversity of perspectives and levels of expertise is a major asset, and the Healthy Buildings team understands that everyone has particular incentives for participating and varying notions of the ideal program design. The team is continuing to negotiate how to develop the most robust program design given capacity, resources and the interests of partners.