# Out of Gas, In With Justice: The Impacts of Cooking Electrification in Multifamily Low-Income Housing in New York City

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**ABSTRACT**

Burning fossil fuels in residential buildings for cooking and heating is a significant source of indoor air pollution that negatively affects human health and disproportionately affects low-income communities and communities of color. The non-profit WE ACT for Environmental Justice led a pilot study to investigate the feasibility and air quality impacts of cooking electrification in low-income multifamily housing in the Bronx, New York. The study found that shifting from fossil-fueled to zero-emission, high efficiency electric appliances can help maximize health benefits to low-income households. However, significant structural barriers prevent enacting these changes at scale. This paper evaluates existing energy efficiency and electrification programs for low-income multifamily households in New York State and analyzes them based on their ability to address barriers identified through our pilot. The paper then discusses proposed programs for low-income multifamily housing that have been informed by the findings from our pilot, and could alleviate barriers existing programs do not directly address. These findings can be adapted for other urban residential areas to prioritize underserved communities in energy transitions.

## Introduction

A growing body of literature has demonstrated the negative effects of gas stove use on indoor air quality, reporting elevated levels of nitrogen dioxide (NO2) beyond what is considered safe by outdoor air quality standards (Spengler et al. 1993; Hu, Singer, and Logue 2012; Paul et al. 2014; Chan et al. 2020; Lebel et al. 2022a). Low-income households live with higher concentrations of indoor air pollution (Ferguson et al. 2020), particularly those in smaller homes with older appliances, poor ventilation, and inadequate heating that may be supplemented with heat from gas stoves (Seals and Krasner 2020; Kashtan et al. 2024). Disproportionate exposure to indoor air pollution like NO2 from gas stoves may be one of the reasons adults living in public housing are more likely to have asthma than the rest of the population (Kim et al. 2022).

Over the past few years, an increasing number of states and municipalities have sought to reduce emissions by advancing building electrification policies that include the transition away from gas stoves and other gas-powered appliances for heating, cooling, and hot water (Cohn and Esrom 2022). Improved air quality and health outcomes are co-benefits of these climate policies, however, electrifying low-income households where residents are more likely to be exposed and impacted by higher concentrations of NO2 remains a challenge (NYSERDA, NYS DEC, and NYPA 2021; Amann, Tolentino, and York 2023, Kashtan et al. 2024). Low-income households have greater difficulty accessing government weatherization, energy efficiency, and electrification programs to help pay for these retrofits even when these programs exist and are funded (NYSERDA, NYS DEC, and NYPA 2021, Amann, Tolentino, and York 2023).

In 2023, We Act for Environmental Justice released the findings of our Out of Gas, In with Justice pilot - an intervention study that looked at the air quality impacts as well as the

feasibility and challenges of cooking electrification in New York City public housing. While the Out of Gas pilot demonstrated only partial electrification on a small scale, the results found that transitioning away from gas stoves significantly reduced NO2 concentrations inside participating households, and made the case for building electrification from a public health perspective (WE ACT, 2023). However, our pilot faced both physical and administrative barriers that would limit widespread adoption of induction stoves in public housing if left unaddressed, and are indicative of the challenges low-income multifamily households may face when attempting to complete similar or additional electrification projects. Our analysis looks at the barriers we experienced in our pilot and considers the ability of existing as well as newly proposed energy efficiency and electrification programs to address those needs.

## Background

### The Environmental Injustice of Indoor Air Quality

It is well documented that low-income populations and people of color experience higher exposure to outdoor air pollution (Boyce and Pastor 2013; Clark, Millet, and Marshall 2014; Hajat et al. 2015; Ferguson et al. 2020; Tessum et al. 2021), however, indoor air quality remains an under-acknowledged environmental justice issue (Adamkiewicz et al. 2011). Burning fossil fuels in residential buildings for heating and cooking contributes to indoor air quality that can be anywhere from two- to five-times, and up to 100 times more polluted than outdoor air (U.S. EPA 2022). Gas burning stoves emit NO2, a pollutant that has been linked to increasing severity of respiratory illnesses such as asthma (U.S. EPA 2016). NO2 emissions in homes with gas stoves can be anywhere from 50- to more than 400-percent higher than those with electric stoves (U.S. EPA 2008), and increases the risk of an asthma diagnosis over a person's lifetime by 24 percent (Belanger et al. 2013; Lin, Brunekreef, and Gehring 2013). Low-income households and households of color with gas stoves experience higher concentrations of indoor air pollution like NO2 due to the increased likelihood of living in homes that are older, smaller, and poorly ventilated (Ferguson et al. 2020, Kashtan et al. 2024).

Gas stoves increase the likelihood and severity of respiratory illnesses like childhood asthma, a disease that disproportionately impacts Black children in the United States (Naureckas and Thomas 2007; Gruenwald et al. 2022). Residential building electrification, which includes the transition from gas to electric stoves, is a key strategy to reduce indoor air pollution and improve health outcomes for low-income communities and communities of color. Simulation studies conducted in New York and California found that low-income neighborhoods may experience the greatest health benefits from strategies like electrification and energy efficiency in buildings. The New York study found that asthma emergency department visits could drop 10 times more in low-income neighborhoods compared to more affluent neighborhoods (Johnson et al. 2020), while the California study found that disadvantaged communities experienced slightly greater health benefits from reductions in PM2.5 from electrification than the rest of the population (Alexander et al. 2019, 31).

### Case Study - Out of Gas, In With Justice Pilot

The Out of Gas, In With Justice pilot was a ten month air monitoring study that measured indoor exposure to NO2 alongside participant satisfaction between ten apartments transitioning from gas to electric induction stoves and ten apartments with their existing gas stoves in a 96 unit

public housing residential building. By the end of the pilot, all participating households had received an induction stove, including the ten control apartments that kept their gas stoves for the duration of the air monitoring study.[1] While limited in scope, the pilot identified indoor air quality improvements associated with cooking electrification alongside challenges that may prevent more widespread adoption of induction stoves in low-income multifamily households.

**Study context and partnerships.** The Out of Gas, In With Justice pilot took place at 1471 Watson Avenue in a building owned and managed by the New York City Housing Authority (NYCHA) in the Parkchester neighborhood of the Bronx, New York, where asthma hospitalizations for adults are double the city's average (NYC DOHMH 2024). As the city's largest landlord, NYCHA houses 360,970 residents (NYCHA 2023a, 2), or one in 17 New Yorkers. 89% of residents in public housing identify as Black or Hispanic (NYCHA 2022), and the average household income is $24,454. 100 percent of the Out of Gas participants identified as Black or Hispanic, and 75 percent of households earned less than $30,000 annually. The pilot was completed in partnership with Association for Energy Affordability to assist with participant recruitment, building audits, and stove installation. Berkeley Air Monitoring Group and Columbia University Mailman School of Public Health directed the air monitoring data collection and analysis.

**Program financing and capacity.** The Out of Gas pilot provided intensive and comprehensive wrap-around support for participating households while covering all costs associated with electrification. This coverage included all wiring upgrades in individual apartments, new induction ranges, and induction ready pots and pans (WE ACT 2023). The pilot offered multiple touchpoints to learn how to use the new appliances and staff were flexible to participants' schedules when setting up appointments, including coming in after 9-5pm work hours. While most publicly funded programs do not offer this level of service, we saw major benefits to this approach. Residents were overwhelmingly content with their new induction stoves and unanimously preferred them to their gas stoves (WE ACT 2023).

**Study findings.** The results of our pilot confirm that cooking with gas stoves leads to elevated indoor air pollution from NO2, reaching levels that are considered unsafe for outdoor exposure (WE ACT 2023). Air monitoring from the controlled cooking test (CCT) found that NO2 concentrations when cooking with gas stoves increased to an average of 197 ppb, well above the U.S. Environmental Protection Agency's (EPA) outdoor air quality level deemed "Unhealthy for sensitive groups" (100 ppb) (WE ACT, 2023). Long term air monitoring of indoor air after transitioning an apartment from a gas to induction stove revealed a 35 percent reduction in daily NO2 emissions (WE ACT 2023). This was similar, but slightly less than 42-51 percent reductions in NO2 reported in a similar gas-to induction stove study in Baltimore, Maryland (Paulin et al. 2014). Our air monitoring recorded interference from other confounders beyond the gas stove that impacted NO2 concentrations. Researchers hypothesized that a combination of factors, including air exchange between neighboring apartments with gas stoves, pollution from the mobile boiler [2], other gas appliances within participant households, and outdoor pollutants like automobile exhaust, all contributed to the prevalence of higher than expected nitrogen dioxide concentrations. Detailed methods and findings for the long term air monitoring and

[1] 19 out of 20 induction stoves were installed. One household post recruitment revealed that they had a pacemaker and out of an abundance of caution, we did not install a stove at the end of the experiment.

additional findings from short term CCTs and participant focus groups can be found in the Out of Gas report (WE ACT 2023) and Daouda et al. (forthcoming).

**Study recommendations.** The findings are indicative of the lived reality of many low-income households in multifamily buildings - poor housing conditions such as inadequate heating, no ventilation, and outdated, inefficient gas appliances, compounded by an over-polluted neighborhood results in more exposure to air pollutants like NO2 that can negatively impact respiratory health. Replacing gas stoves with induction stoves is part of the solution to address these inequities, however the air monitoring results in the pilot led us to conclude that electrification interventions must be more holistic in order to more effectively reduce exposure to air pollution and maximize health benefits.

**Existing Programs & Barriers to Electrification for Low-Income Housing**

More states are adopting or expanding programs to help existing buildings electrify to meet emissions reductions goals, with the added benefit of improving indoor and outdoor air quality (Cohn and Esrom 2022). Many of these programs help offset the costs of decarbonizing existing buildings, with a focus on weatherization, energy efficiency, and the electrification of space heating and water heating. At the federal level, the Inflation Reduction Act (IRA) will invest over $50 billion in tax credits, rebates, and energy efficiency programs to offset electrification project costs. The Home Electrification and Appliance Rebate Program (HEAR) provides point-of-sale consumer rebates to cover 100 percent of electrification project costs (up to $14,000) for low-income households and 50 percent of costs for moderate-income households. The Home Energy Performance Based, Whole-House Rebate Program (HOMES) incentivizes whole-home retrofits and energy efficiency upgrades, with specific benefits for multifamily, low-income buildings. The Energy Efficient Home Improvement Credit (tax credit 25C) offers tax credits to lower the cost of heat pump installation. The IRA is a transformational investment to decarbonize the building sector, however its programs will only cover a fraction of the anticipated costs. One analysis of New York's housing stock estimates that IRA subsidies will cover only ten percent of the overall costs needed for full electrification (Shron & Velez 2024).

This disparity forces states to fill in the gaps. In recent years, New York has taken major steps to reduce building pollution, passing city- and state laws to phase gas appliances out of new construction (Ramirez and Nilson 2023), and emissions reduction laws like the Climate Leadership and Community Protection Act (CLCPA) in New York State and Local Law 97 in New York City. The state has simultaneously grown its portfolio of programs to support building decarbonization through energy audits, energy efficiency and weatherization efforts, and electrification programs, with specific programs targeting multifamily and affordable housing. However, current programs are piecemeal, as their eligible measures do not comprehensively address all of the physical and economic barriers to a whole-home retrofit. They are also failing to penetrate low-income housing (PSC 2018, 53), with multifamily buildings being some of the hardest to reach (Con Ed 2023, 26). In 2018, New York's Public Service Commission (PSC) reported that efforts by the New York State Research and Development Authority (NYSERDA), gas utilities, and the Weatherization Assistance Program (WAP) have only reached 12% of eligible low-to-moderate income households over the last 12 years, "leaving much to be

[2] The building was severely damaged by flooding during the remnants of Hurricane Ida in September 2021 which required the installation of a temporary mobile boiler for space heating in the building's courtyard (which was still in use for the duration of the pilot) (OMB 2022).

accomplished" (PSC 2018, 53). The PSC acknowledged that low-income customers face unique barriers that prevent program participation that will require more prioritized attention (PSC 2018, 19).

A whole home retrofit must combine the remediation of health and safety concerns with weatherization, energy efficiency retrofits and appliance electrification to reduce energy use and peak electric demand, avoid increasing energy burden, and maximize health benefits (Hong et al. 2023; ACEEE 2023; Cohn and Esrom 2022, ACEEE 2021). Low-income households are more likely to live in homes that are poorly insulated and have a prevalence of health and safety issues, such as mold, lead, asbestos, or pests (EIA 2023) which can disqualify them from accessing weatherization programs, or dramatically increase the cost of interventions. A lack of financing options to cover upfront costs related to health and safety concerns is prohibitive and unattractive to building owners who do not live on the property and will not see cost savings from these repairs (NYSERDA, NYS DEC, and NYPA 2021). Other reports have identified barriers specific to energy efficiency and building electrification. For example, Amann, Tolentino, and York (2023) discuss barriers to energy efficiency, including difficulties with outreach and engagement with low-income customers, high up-front costs for energy efficiency approaches without affordable financing options, and the split incentive challenge. Cohn and Esrom (2022) describe similar cost barriers for low-income households in accessing building electrification programs, as well as specific challenges for low-income renters who have limited control over decision-making. They also describe barriers for homeowners and building owners, including high upfront costs for equipment and higher operating costs in some areas, as well as for policymakers, such as conflict of interest with gas utilities and the ineffectiveness of traditional cost-benefit analysis that do not adequately consider the full range of health benefits of electrification (Cohn and Esrom 2022). A Barriers Report by NYSERDA, the state Department of Environmental Conservation (NYS DEC) and New York Power Authority (NYPA) (2021) found that overly complex bureaucratic procedures that require applications to different programs with narrow and inflexible scopes of work and varying eligibility requirements and timelines restrict access for multifamily buildings. Limited agency personnel to support program recipients and overall mistrust in state authorities also serve as barriers that prevent meaningful participation in decarbonization programs (NYSERDA, NYS DEC, and NYPA 2021).

## Out of Gas, In with Justice Barriers

Empirical case studies that implement and assess in-situ electrification projects can serve to highlight context-specific barriers and strategies to address them in different settings. Even with its limited scope, the Out of Gas pilot was an opportunity to assess the challenges of transitioning from gas stoves to electric induction stoves in affordable housing with the goal being to inform policies that will make the widespread adoption of induction stoves and electrification writ large more accessible for lower income populations.

**Inadequate infrastructure for electrification**. The age of New York's residential building stock is a major barrier to electrification, particularly for multifamily affordable housing that is structurally unsound and requires major investments before it can consider electrifying its building systems (Shron & Velez 2024). At 1471 Watson Avenue, the induction ranges installed during the pilot required an additional 220 volt outlet and accompanying 40 amp pole breaker in every participating apartment. Due to the building's limited electrical capacity and concerns that an increase in electricity demand beyond two induction stoves per vertical line would overload

the system, we were only able to enroll two apartments per line in the pilot. This limited our ability to recruit the most viable households that had participants who cooked regularly, would be home for the duration of the study, and were interested in participating. It also limited NYCHA's ability to fully electrify the building's cooking appliances at the end of the pilot or pursue other electrification pilots like the installation of heat pumps. Upgrading the electrical capacity of the building is a costly endeavor, with some estimates placing the cost at $40,000 per unit (Scott & Mills 2023). It is also an invasive procedure that requires residents to provide access to their units for capital repairs. In addition to the electrical capacity, the building was severely damaged during a storm in 2021 and required maintenance to its roof, plumbing, and heating systems (OMB 2022). This deferred maintenance could potentially prevent weatherization projects needed to electrify the building, however there are limited funding options available for this work.

**Programmatic design and implementation.** The Out of Gas pilot removed any bureaucratic requirements from households as a barrier to participation. The only requirement was that the participant lived at 1471 Watson Avenue and used their stove regularly. The elimination of means-testing ensured that everyone was eligible and that the sign-up process was seamless and unobtrusive. While the pilot needed the approval and collaboration of NYCHA administrative staff and building managers, day-to-day implementation was largely independent of the authority. Many residents voiced deep-seeded mistrust of the authority and its ability to address issues in their apartments during the recruitment process. AEA previously contracted with NYCHA to complete weatherization work in the building (NYCHA 2024), which allowed outreach staff to build relationships with residents in advance of the pilot. These pre-existing relationships proved instrumental during recruitment, as residents already had an established level of trust in outreach staff. Multiple households agreed to participate only after they confirmed this was another project with AEA and not associated with NYCHA and their building's management team. This suggests that even in collaborative partnerships with government entities and other organizations, identifying a trusted point source to directly interact with community members may help facilitate the process.

## Existing Programs: Barriers and Alignment with Out of Gas Findings

The Out of Gas study found a critical need for comprehensive whole-home retrofits to more fully realize air quality improvements in affordable multifamily housing. Within New York's current portfolio, there are two programs - EmPower+ and Affordable Multifamily Energy Efficiency Program (AMEEP) - specifically tailored to advance comprehensive electrification and energy efficiency upgrades in low-income multifamily buildings, as well as incoming programs from the federal Inflation Reduction Act (IRA). However these programs do not address the full range of barriers that low-income households face, which leaves a critical gap in service and access for affordable housing residents. Here, we present an analysis of EmPower+, AMEEP, and the tax credit and rebate programs from the IRA based on their available measures offered and whether these measures help to alleviate identified barriers for low-income households.

**EmPower+.** EmPower+ is a statewide program for 1-4 family low-to-moderate income homes that provides no-cost (for low-income) or subsidized (for moderate-income) energy efficiency upgrades and energy education for both renters and homeowners in a "whole home" approach.

Households first receive a home energy assessment by a contractor within the EmPower+ network that makes them eligible for different efficiency measures based on the results. Some proposed measures include building shell improvements like insulation, air sealing, and weather stripping, electric load reduction, HVAC repairs, tune-ups, and replacements, including heat pump installations for households that meet eligibility requirements such as minimum insulation levels (NYSERDA 2023a), domestic hot water improvements and replacements, and minor health and safety improvements such as gas leak repairs, smoke and carbon monoxide detectors, combustion safety, and venting (NY Utilities and NYSERDA 2023; NYSERDA 2024b.).

As part of the EmPower+ program, renters are eligible for energy upgrades that do not require landlord approval. This measure may lower application barriers and helps to address the issue of the split incentive, although it is limited in scope. However, the program does not address the potential shift of utility costs to renters in households that were once master metered and are now sub-metered after receiving in-unit electric heating. The eligibility constraints for the state's EmPower+ program also severely restrict low-income households in New York City from accessing the program because it uses the State Median Income instead of the more inclusive Area Median Income to determine eligibility (Pratt Center for Community Development 2024). As a result, only seven percent of EmPower+ retrofits have occurred in New York City, despite being home to half of the state's population (Pratt Center for Community Development 2024). In addition, measures to address health hazards and structural repair issues like electrical upgrades that are necessary to facilitate further energy efficiency projects are not covered. Electrification appliances like induction stoves are not included in the program offerings, and minimum insulation levels may exclude lower income households from receiving a heat pump. The Out of Gas study recommended more programs offering electric appliances include induction stoves and induction ready cookware, including EmPower+ (WE ACT 2023, 48). This recommendation has not yet been incorporated into the program and may be a missed opportunity for expanded offerings that bring a home closer to full electrification.

**Affordable Multifamily Energy Efficiency Program (AMEEP).** One of the few programs that targets multifamily buildings and has an option for more comprehensive energy efficiency upgrades is AMEEP, a statewide program administered collectively by utilities and NYSERDA. AMEEP is intended to enable existing affordable multifamily business owners, developers, and their representatives to access financial incentives that encourage comprehensive, whole-building energy efficiency retrofits, although the program does not incentivize the electrification of building systems. Some examples of eligible measures include window, boiler, and domestic hot water heater replacements with more efficient systems, insulation, and air sealing (NYSERDA, 2024a). One downstate utility, Con Edison, offers fuel switching incentives for electric HVAC equipment, but not other appliances like heat pumps or stoves.

AMEEP provides incentives directly to the building owner or manager and is designed specifically for the affordable multifamily housing sector, which an ACEEE report calls out as a way to overcome the split incentive barrier for renters (Cohn and Esram 2022, 61). While AMEEP is also extremely flexible for buildings on the comprehensive pathway, allowing owners to pick and choose what incentives they want to receive, it is only available to buildings that pay into the system benefit charge (SBC) on utility bills that fund NYSERDA programs. This leaves public housing authorities such as NYCHA and older, low-income buildings still reliant on fuel oil, ineligible. Like EmPower+, AMEEP does not cover health and safety measures for energy efficiency or electrical upgrades for electrification-readiness, cost preventative requirements that disqualify buildings from receiving future benefits.

**Federal Programs: Inflation Reduction Act.** The Inflation Reduction Act (IRA) tax credit and rebate programs can help low-income households address some of the physical conditions in their homes that prevent whole-home retrofits like electrical upgrades. However, the available incentive covers only a fraction of the cost that upgrades will be which requires households to have access to capital to cover the associated costs (Reeg and Smedick 2023). Similarly to New York's funding and programs, the IRA also does not offer funding to address health and safety concerns, and in New York rebates cannot go towards cooking electrification. In addition, research shows that access to incentives in the form of tax credits and rebates are typically lower for communities of color and renters, especially low-income households that lack sufficient tax liability (Jacobsen 2024). This disadvantage has direct implications for New York City's environmental justice communities, who will be less likely eligible to receive the benefits. The Out of Gas report recommended the flexible usage of IRA funds to allow for braiding with state incentives and the development of a reimbursement program in lieu of a tax credit program to allow lower-income residents to maximize on incentives to avoid financial and economic barriers (WE ACT 2023). Recently, NYSERDA announced that the first allocation of HEAR rebates will help expand the EmPower+ program to cover additional services like air sealing, insulation, and ventilation, electrical service and wiring upgrades, heat pump water heaters and space heaters. Applicants will be automatically enrolled in the HEAR program when they apply for EmPower+. This type of braiding is a step in the right direction to simplify bureaucratic processes and application requirements around electrification programs and expands more holistic retrofits.

Despite the expansion of EmPower+ with HEAR rebates, none of the programs mentioned include a comprehensive enough set of measures, funding, or capacity to enable whole-home retrofits, particularly in households with deferred maintenance and health and safety concerns. Even if these programs were braided together and eligibility requirements were consistent, low-income buildings would have to apply to multiple programs at once, creating another bureaucratic barrier, and would still experience gaps in funding to address pre-weatherization retrofits. States need to reconsider decision-making processes around energy efficiency and building electrification funding allocation and program design. Typically, public utility commissions in states rely on a cost-benefit framework that has not historically centered health in its decision-making (Ciulla et al. 2021). These misaligned priorities, which may cause an underemphasis on comprehensive retrofits in harder to reach households that need significant investment in measures that might not have a long-term pay off, like mold or pest remediation. Additional frameworks are needed to explicitly value and prioritize the health and safety benefits of mitigating contaminants and implementing energy efficiency and electrification strategies for low-income households.

## New Proposals Informed by Out of Gas Pilot

The findings from the Out of Gas, In With Justice pilot have informed two new building decarbonization proposals that directly respond to the identified barriers and gaps in existing programs. While both still only proposals, they offer promising solutions to enable the wider adoption of induction stoves and whole home retrofits in low-income housing.

**NYCHA's Induction Stove Challenge**: In July, 2023, NYCHA announced an agreement between NYPA and NYSERDA to launch the Induction Stove Challenge - an innovation competition between appliance manufacturers for an electric cooking appliance that can replace existing gas stoves while plugging into existing 120 volt/20 amp outlets in older buildings, thus

avoiding costly and time consuming electrical upgrades (NYCHA 2023b). NYCHA plans to purchase 100 stoves from the winning manufacturer as a pilot with the intention to purchase at least 10,000 stoves and the ultimate end goal of replacing all gas stoves across NYCHA's properties. The announcement, which references the Out of Gas pilot as a precursor, suggests NYCHA's intention to address barriers identified through the pilot, specifically building limitations that could prevent electrification projects from moving forward. NYCHA has a precedent of using its buying power to transform markets and bring down costs of multifamily household appliances, as it did in the 1990s with efficient apartment-sized refrigerators (ACEEE 1996). In its Induction Stove Challenge announcement, NYCHA named its intention to create an appliance that will have nationwide relevance and will "build a pipeline of potential demand from others pursuing cooking electrification, aligning NYCHA's product specifications with the needs of the broader market" (NYCHA 2023b).

As a public authority and landlord, NYCHA is well positioned to be a leader in the building decarbonization space. They also house vulnerable populations in environmental justice communities that have the most to gain from improved air quality as a result of beneficial electrification. The Induction Stove Challenge could be an opportunity to scale the results of Out of Gas to more households in public housing that maneuvers around the limitations of the building's existing physical condition instead of undergoing costly and extensive full building electrical service upgrades. However, as our pilot discovered, NYCHA will need to handle implementation with care, understanding the negative perception residents may have against the authority. To ensure a positive roll out, NYCHA needs to commit to deep community engagement, including support from trusted community partners, building managers, tenant associations, that educates people on the transition and highlights the potential benefits. Culturally relevant educational materials, live demonstrations, outreach by trusted partners and testimonies from current recipients are all possible methods to improve community trust.

**Green Affordable Pre-Electrification Fund:** In 2023, legislation to establish a green affordable pre-electrification program ("GAP Program") was introduced.[3] The program will provide technical assistance and grants or forgivable zero percent interest loans to income eligible households and buildings in need of a wide-range of currently unfunded retrofits that are necessary for electrification. In many cases, this pre-electrification work is too costly for building owners to take on themselves and will prevent households and building owners from being able to participate in other energy efficiency and weatherization programs. The GAP fund would provide tiered grant funding for LMI homeowners, renters, property owners with low-income tenants, and importantly, public housing authorities like NYCHA. The program can be used to address issues of deferred maintenance like roof repair, water intrusion, or structural issues, mitigate environmental health hazards like mold, asbestos, and lead, update electrical service, panels, and wiring along with other mechanical systems, improve building envelope and replace aged out fossil fuel appliances with a new high efficiency electric appliance, including stoves.

The Out of Gas pilot findings and recommendations informed the proposed GAP fund, which is a direct response to the structural barriers that prevent low-income households from taking advantage of, and benefiting from, the substantial resources available for weatherization and electrification through existing state and federal programs. Its inclusion of public housing

[3] Senate Bill S8535. *Establishes the green affordable pre-electrification program.* (2024). https://www.nysenate.gov/legislation/bills/2023/S8535.

authorities is a welcome change from other existing state programs like AMEEP and EmPower+. This legislation remains a top priority of building decarbonization advocates leading into the 2025 legislative session.

## Conclusion

The Out of Gas pilot supports a growing body of evidence that confirms electrification of housing in communities disproportionately impacted by indoor air pollution has multiple co-benefits related to health and climate. However, there remain substantial hurdles to participate in existing energy efficiency and electrification programs for low-income households that will continue to disqualify them from receiving their intended benefits. The Out of Gas pilot, along with its recommendations and strategies to overcome barriers to electrification can pave the way for future, scalable efforts that successfully reach low-income tenants in multifamily buildings.

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