

Green, Healthy Schools

A Blueprint for Mayor Adams





About ALIGN

ALIGN's mission is to create good jobs, vibrant communities, and an accountable democracy for all New Yorkers. Our work unites worker, community, and other allies to build a more just and sustainable New York.

For more information visit www.alignny.org



About the Climate Works for All Coalition

The Climate Works for All Coalition, led by ALIGN and NYC EJA, is a citywide partnership of over 50 labor, environmental justice organizations, faith, and climate advocates united to ensure that efforts addressing climate change create good career-track jobs, and prioritize low-income climate-vulnerable New Yorkers.

Learn more at nyclimateworks.org



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Executive Summary

K-12 public schools are among the biggest public polluters in New York City.¹ NYC has the largest school district in the country and the agency that makes up one-quarter of the City's public building stock, so what happens with public schools in the coming years will significantly shape recovery, especially in low-income Black and brown communities that have borne the brunt of both historic environmental racism and the COVID-19 pandemic.

Green, Healthy Schools are a long-term solution that yields short-term results. Citywide emission reductions will require an expansion of renewable energy generation and investments towards energy efficient buildings. Many of the City's K-12 public schools are older buildings that rely on inefficient, fossil fuel dependent systems for essential needs like heating and cooling. Investing in renewable energy sources like solar and conducting deep retrofits that directly address energy inefficiency can help New York City significantly reduce its emissions. The City can and should start this work on K-12 public schools. Research estimates that if New York City became a net-zero school district by 2030, it could reduce emissions by 713,382 metric tons of CO₂e.²

Last year, we released an action plan for the City to equitably invest in its environmental justice communities by creating Green, Healthy Schools.³ This report is a follow-up to that action plan and assesses the City's progress towards two key climate goals: installing 100 MW of solar energy on public buildings and reducing emissions to meet targets outlined in Local Law 97 of 2019. Both of these goals complement the 2019 Climate Leadership and Community Protection Act (CLCPA), and set the stage for New York City to build regenerative economies that address renewable energy generation, sustainable manufacturing, and more resilient communities.

Now more than ever, New York City must prioritize investments and job creation for the communities that have been hit the hardest by both the COVID-19 pandemic and long standing environmental racism. Investing in Green, Healthy Schools will be critical to ensuring the City does its part to get New York State in compliance with its CLCPA goals, and will create thousands of good, green jobs. New York City can do this by annually investing at least \$1.8 billion by 2030.



Key Findings and Highlights of this Report:

- Significant citywide emission reductions will require an expansion of renewable energy generation and investments towards energy efficient buildings.
- A majority of K-12 public schools are older buildings that rely on inefficient, fossil fuel dependent energy systems for everyday essential needs like heating and cooling. Because of this, public schools are among of the biggest polluters in the city.
- Installing solar systems to reduce the City’s reliance on fossil fuels and conducting deep retrofits that target energy inefficiency in K-12 public schools will be critical components of New York City’s greater emission reduction strategy.
- If New York City became a net-zero school district by 2030, it could reduce emissions by 713,382 metric tons of CO₂e.⁴
- New York City is more than 80 percent behind on its 100 MW solar energy goal. With only 15.6 MW installed, the City will need to install at least 43 MW each year by 2025 to meet its solar commitments.
- Prioritizing solar installations in K-12 public schools will reduce air pollution, support the City’s transition away from fossil fuels, and allow the City to make aggressive progress toward its solar goal.
- New York City public schools spend \$275 million per year on energy costs alone. Research estimates deep retrofits can result in 50 percent energy savings, which means New York City could save at least \$175 million per year in energy costs by conducting deep retrofits in all K-12 public schools.⁵
- Deep retrofit repairs in K-12 public schools, like HVAC installation, will ensure the City prioritizes health and climate equity in its recovery efforts. Research suggests air control systems and reliable air quality monitoring can minimize the airborne transmission of COVID-19.⁶ 70 percent of schools with the highest ventilation needs are located in environmental justice communities, highlighting the disproportionate resource distribution in low-income Black and brown neighborhoods already burdened by the climate crisis.
- The City can and should annually invest \$1.8 billion by 2030 to become a net-zero school district, ensuring that all students have equitable access to clean air at school, no matter their zip code.

New York City Public Schools are Among the Largest Public Polluters in the City

New York has a once in a lifetime opportunity to address the impacts of both the ongoing climate crisis and its disproportionate impacts on environmental justice communities-- low-income Black and brown neighborhoods most vulnerable to climate change. At the state level, New York is drafting an ambitious climate action plan that will bring the 2019 Climate Leadership and Community Protection Act (CLCPA) to life. As the state boldly envisions how to justly transition to a zero-emission economy, it will be up to New York City to build off this historic momentum and bring the promise of resiliency home.

The CLCPA requires New York State to reduce emissions 85 percent by 2050. In New York City, buildings account for over 70 percent of city greenhouse gas emissions.⁷ K-12 public schools in particular account for one-quarter of all city-owned buildings,⁸ which means renewable energy and energy efficiency projects in schools will make a significant impact toward citywide emission reductions.

“New York City Public Schools need solar systems and deep retrofits because we need to reduce greenhouse gas emissions to ensure the health and safety of everyone. We need to conduct deep retrofits because it will result in at least 50% reductions in energy consumption and help more students be involved in sustainability. New York City public schools are among the biggest public climate polluters so we need to strive to make climate reforms.”

Prisha Rao
TREEage Lead Queens Organizer
Townsend Harris High School



K-12 public schools are among the biggest public polluters in New York City.⁹ Many of the City’s public schools are older buildings that rely on inefficient, fossil fuel dependent systems for everyday essential needs like heating and cooling. Investing in renewable energy sources like solar and conducting deep retrofits that directly address energy inefficiency could reduce emissions by 713,382 metric tons of CO₂e by 2030.¹⁰

Due to the sheer size and carbon footprint of K-12 public schools, what happens in the coming years will significantly shape recovery needs, especially in environmental justice communities that have borne the brunt of both historic environmental racism and the COVID -19 pandemic.

K-12 public schools continue to be among the institutions hit hardest by the COVID-19 pandemic. For the past two years, school shutdowns disrupted the lives of countless families, students, faculty, and teachers.¹¹ Research conducted by Harvard University’s Center for Education Policy shows students lost about 50 percent of a typical school year’s math learning due to remote instruction; this is even more pronounced among low-income students, who fell further behind in learning retention compared to their higher-income peers.¹²

Today, disparate student vaccination rates in New York City schools continue to present an obstacle for in-person learning, with positive cases more than doubling since New York City dropped critical protections like masking in schools.¹³ In fact, public school students had an average daily infection rate of 13.3 per 100,000 people after two weeks without mandatory masking, this is 39 percent higher than the citywide average (9.6).¹⁴



The connections between COVID-19, climate change, and public health are clear—high deaths rates from COVID-19 are clinically linked to long term exposure to air pollution,¹⁵ and evidence further suggests that the installation of air control systems - along with reliable indoor air quality monitoring - can minimize the airborne transmission of COVID-19.¹⁶ Not only does reducing city greenhouse gas emissions and improving air quality align with state-level priorities like the CLCPA, these interventions will also have consequential positive health outcomes and save lives.

Significant citywide emission reductions will require an expansion of renewable energy generation and investments towards energy efficient buildings. New York City has already taken steps to do this. In 2014, the City committed to installing 100 MW of solar energy on public buildings by 2025. In 2019, the City passed Local Law 97 to reduce emissions 80 percent by 2050. Both of these goals complement the CLCPA and set the stage for New York City to build regenerative economies that address renewable energy generation and sustainable manufacturing.

These commitments are significant and will be critical to ensure the City does its part to get New York State in compliance with the CLCPA. New York City has the power and resources to set a model for compliance across the state, starting with K-12 public schools. But, the City's made slow progress towards achieving its climate goals. New York City is immensely behind on its 100 MW target, and there is still a need for more detailed, comprehensive audits on school ventilation.

The Green, Healthy Schools campaign offers Mayor Adams an equitable action plan to reach the City's climate goals and address pandemic recovery needs. Energy efficiency and renewable energy projects can and should be implemented in K-12 public schools. Installing solar panels and conducting deep retrofits in public schools will help New York City and New York State enhance air quality; create good, green jobs; and foster resilient communities.

Nationally, K-12 public schools typically spend \$8 billion on energy costs annually, the second highest operating expenditure for schools after personnel costs.¹⁷ In New York City, the Department of Education (DOE) spends \$275 million per year on energy costs alone.¹⁸ Solar systems and deep retrofits will help the DOE reduce its operating costs, and focus funds on other priorities that directly benefit students, teachers, and faculty. Industry experts estimate the upgrades outlined in the Green, Healthy Schools plan will result in at least 50 percent energy savings, or \$175 million in saved energy costs per year.¹⁹

In the recent 2023 Executive Budget, Mayor Adams allocated \$900.8 million toward building system upgrades in New York City schools.²⁰ If this allocation were directed toward solar installation and deep retrofits in K-12 public schools, it could benefit approximately 159 schools. Investing in Green, Healthy Schools will be a step in the right direction for the City, and will build the foundation needed to ensure health and climate equity is prioritized across all infrastructure projects. **New York City should annually invest at least \$1.8 billion by 2030 to create Green, Healthy Schools, prioritizing those located in environmental justice communities.**



New York City More Than 80 Percent Behind on Solar Goal

In 2014, New York City committed to installing 100 MW of solar energy on public buildings by 2025. Thus far, the Department of Citywide Administrative Services (DCAS) has installed a total of 15.6 MW of solar energy on public buildings.²¹ About 11.7 MW of that capacity exists in K-12 public schools, which means DCAS has installed an additional 3.5 MW on schools since last year.

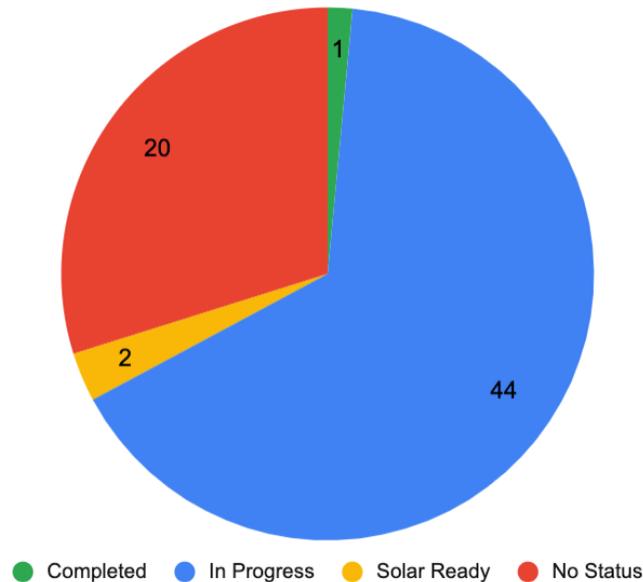


Figure 1. Total Solar Systems Installed on 67 Priority Schools

With support from the Climate Works for All Coalition, DCAS previously identified a list of 67 priority schools in need of immediate solar siting. These schools met several indicators for environmental justice and feasibility. Of these 67 priority schools, only 1 has been completed. 44 of these schools are currently in progress; 2 are solar-ready; and 20 schools have not been worked on.²²

With only two and a half years left to meet its 100 MW solar goal, New York City must do more and faster. The City will have to install at least 43 MW per year by 2025 to stay on target. DCAS is currently working on 127 schools and has identified another 109 schools that are solar-ready.²³ If the City were to prioritize the completion of these projects, it would already be halfway toward its 100 MW solar goal. In addition to swift solar installation, the City should also install at least 3.3 GW of battery storage. This will be critical to keep neighborhoods resilient during extreme climate events like Hurricane Ida. Based on current DOE energy consumption data,²⁴ analysis estimates it will cost a total of \$9.4 billion to install solar panels in all K-12 public schools plus 3.3 GW of battery storage.²⁵



Deep Retrofits In K-12 Public Schools Can Reduce Emissions By At Least 50 Percent

Local Law 97 of 2019 requires New York City to reduce its greenhouse gas emissions 40 percent by 2030 and 80 percent by 2050. This aligns with CLCPA emissions targets, which require the state to reduce emissions 85 percent by 2050. K-12 public schools make up a sizable portion of the City's public building portfolio and are among the biggest public polluters in New York City.²⁶ This means deep retrofits in K-12 public schools will have a significant impact on citywide emissions reductions. In fact, research indicates deep retrofits can reduce school emissions by at least 50 percent²⁷ and lead to \$175 million in energy cost savings per year.²⁸

Further, deep retrofit repairs in K-12 public schools will ensure the City prioritizes both climate and health equity in its recovery efforts. A majority of New York City K-12 public schools are older buildings that rely on inefficient, fossil fuel dependent energy systems for everyday essential needs like heating and cooling. A deep retrofit is a whole building approach to achieve large energy cost savings that can be implemented over time, as compared to conventional retrofits. Retrofit repairs like building envelope upgrades, smart control upgrades, and air handling system replacements can help directly address energy inefficiency, resulting in lowered energy usage and reduced carbon emissions that pollute the air.²⁹

70 percent of the schools with the highest ventilation needs are located in environmental justice communities

At the start of the pandemic, DOE's Division of School Facilities (DSF) partnered up with the School Construction Authority (SCA) to conduct ventilation audits in every K-12 public school. While this data helps provide a preliminary birdseye view of the current state of school ventilation, more detailed, comprehensive data is needed to assess the distinct needs of each school building and how they compare with federal ventilation compliance standards.

Mirroring similar trends on the impacts of historical environmental racism in New York City, this audit data indicates a majority of schools in need of repairs are located in environmental justice communities

in the outer-boroughs. About 70 percent of the K-12 public schools with the highest ventilation needs are located in environmental justice communities. Further, 52 percent of these schools are located in Brooklyn. Approximately 48,215 students are enrolled in these schools.

This is emblematic of historic environmental racism concentrated in New York City's environmental justice communities. The decades-long divestment and deprioritization of equitable climate resiliency projects have resulted in crumbling infrastructure and increased chronic health issues concentrated in low-income Black and brown neighborhoods already burdened by the climate crisis.

At the school level, both students and faculty suffer from poor air quality and inadequate ventilation. Studies show students with higher exposure to localized pollution had lower test scores, missed more school time, and were more likely to develop behavioral issues than their peers.³⁰ These effects persist even after the student moves to a less polluted area. Concomitantly, school lunch workers have long voiced concerns over stifling conditions in school kitchens, where temperatures can rise as high as 135 degrees.³¹ Deep retrofit repairs like air handling system replacement and smart control upgrades can directly address poor air quality in K-12 public schools.

New York City should prioritize deep retrofits in K-12 public schools that exhibit the largest need—those located in environmental justice communities that have a majority of rooms without an existing air control system. Analysis estimates it will cost \$5.2 billion to conduct deep retrofits in all K-12 public schools.³²

New York City should also establish a ventilation compliance unit housed within the SCA to analyze school ventilation, recommend repairs, improve scope and design standards, and advise the City on its capital plans. This unit would comprise a director, a mechanical engineer, architects, and would make use of existing inspectors within SCA.

"I've worked with the Board of Education for the last 21 years. I love my job. I look forward to it every morning, but working in school kitchens is no joke. School kitchens get really hot, especially during the summer. My coworkers and I have had to work in extremely hot conditions. Sometimes the kitchens get so hot it feel like it's 100 degrees inside. This is not a good working environment. Our schools need better air handling control systems so we can focus on our job, and provide healthy and nutritious food for our students."

Janice Sutherland
Head Cook
PS 33 in Queens



Local Hiring and Union Placement Support Sustainable Employment in Green Industries

Green, Healthy Schools will create good-paying, career jobs for journeypersons who've suffered pandemic-related job losses, in addition to apprentices and new entry workers joining the green workforce. Research estimates an annual investment of \$1.8 billion by 2030 toward deep retrofits and solar installation in K-12 public schools can result in over 62,000 direct jobs per year.³³ This is in addition to the thousands of jobs that will be created by the greater Community Mobilization Act of 2019.

Project Labor Agreements (PLA) between New York City and the Building and Construction Trades Council of Greater New York cover new construction and renovation projects that use public funds. PLAs and contractual agreements like prevailing wages and community hiring, can make the difference between a low-wage job and a long term career. Green, Healthy Schools will be covered by this PLA, which means expanded union-track career opportunities for both established and new-entry workers across green industries.

Local hiring and union placement supports sustainable employment. Successful union-linked pre-apprenticeships and apprenticeships already train workers for these jobs, along with other long-term skills that are essential to maintaining sustainable careers in clean energy. Workforce development coupled with community hiring practices will expand opportunities for traditionally underrepresented New Yorkers in green industries including many women, immigrants, and Black and brown New Yorkers.

“ I am currently a Journeywoman Electrician in the International Brotherhood of Electrical Workers (IBEW) Local Union # 3. I would never have imagined that I would have become an Electrician in one of the most powerful labor unions in America as an adult. But nine years into my career, I still believe it is one of my most significant decisions. I would not have made it into the union without NEW's (Nontraditional Employment for Women) guidance with their pre-apprenticeship program specializing in preparing womxn for careers in the blue-collar field.”

Shauna Irving, Local 3, IBEW
'A' Construction Journeywoman



The Build it Back program is a successful community hiring model the City should build on. New York City leveraged federal funding to create the Build it Back community hiring program to stimulate economic growth and rebuild areas most impacted by Hurricane Sandy. The community hiring program focused on union apprenticeship placements and job placements, and ultimately has created more than 13,000 direct jobs.³⁴

New York City should build on the community hiring program's model and incorporate the following three considerations to improve its effectiveness:

- Collaborate with union-linked direct-entry programs and apprenticeships to ensure community based organizations have time to recruit and organize local workers for these opportunities.
- Fund local, targeted outreach in different languages to increase program enrollment.
- Fund classes for Test of Adult Basic Education (TABE) preparation and GED tests that can be paired with pre-apprenticeship programs.



My career with IBEW local 3 has provided me with opportunities beyond a great salary, pension, college degree, and job security. From the time I started in the pre-apprentice program "Construction Skills" I was encouraged to pursue a variety of my interests within the union including community involvement, mentorship programs, and now helping to advocate for the use of alternative energy, which will ultimately promote the growth of jobs for the community and new members into our union to have the same opportunities as myself."

Manny Yllescas, Local 3 IBEW,
'A' Construction Journeyman



Green, Healthy Schools are a Long-term Solution that Yields Short-term Results

New York has a once in a lifetime opportunity to address the impacts of both the ongoing climate crisis, and its disproportionate impacts on environmental justice communities. Investing in strategies that reduce greenhouse gas emissions not only aligns with state-level priorities like CLCPA, but will also result in consequential positive health outcomes and save lives.

Significant citywide emission reductions will require an expansion of renewable energy generation and investments towards energy efficient buildings. Installing solar panels and conducting deep retrofits will help improve air quality, significantly reduce the City's carbon footprint, and enhance student performance, engagement, and attendance.

New York City should make an annual investment of at least \$1.8 billion by 2030 to create Green, Healthy Schools, prioritizing those located in environmental justice communities. In order to ensure efficient and transformative implementation, additional funds must also be invested in proven union-linked workforce development programs to support the growing demand for workers across green industries.

Now more than ever, New York City must prioritize investments and job creation for the communities that have been hit hardest by both the COVID-19 pandemic and long standing environmental racism. As New York State boldly envisions how to justly transition to a zero-emission economy, it will be up to the City to build off this historic momentum and bring the promise of resiliency home for the most climate-burdened New Yorkers. Green, Healthy Schools will be a critical piece to that puzzle, ensuring the City does its part to get New York State in compliance with its climate goals, and that all New Yorkers have access to a green and healthy school no matter their zip code.



Methodology

Cost Analysis

This analysis considers all buildings under the Department of Education, which covers an approximate average total square footage of 162,006,267.³⁵ The Climate Works for All Coalition estimates it will cost an annual investment of at least \$1.8 billion by 2030 to conduct deep retrofits and install solar systems in all K-12 public schools.

Retrofits– the coalition estimates it will cost approximately \$5.2 billion to conduct deep retrofits in all K-12 public schools. At a range of \$32 per sq ft, we anticipate the deep retrofits will result in at least 50 percent in energy savings and emissions reductions. These deep retrofits are in addition to electrifying all systems (refer to Figure 2). The \$32 per sq ft estimate includes materials and labor costs.

Figure 2. Recommended Deep Retrofit Repairs by Cost

Retrofit Repair	Estimated Energy Reductions	Price Per Sq Foot
Deep Retrofit ³⁶	> 35%	\$15 - 18
All Electric Systems ³⁷	18 - 24%	\$12 - 14
Total	53 - 59%	\$27 - 32

Solar– the coalition estimates it will cost approximately \$5.4 billion to install solar systems in K-12 public schools. This estimate uses a \$5 per watt rate and is based on DOE’s average energy consumption levels. Our analysis considers 53 percent energy savings as a result of deep retrofits. Including 3.3 GW of battery storage brings this total to \$9.4 billion. The rate includes materials and unionized labor costs.



Build it Back Jobs Analysis

New York City’s CDBG-DR federal funding program is purported to have created over 24,000 jobs, of which 12,801 may be directly tied to the Build it Back program.³⁸ New York City also leveraged CDBG-DR to create a separate program for those directly impacted by Hurricane Sandy. Since these programs had similar missions to rebuild infrastructure and economic resources after Sandy and benefited from a streamlined funding structure, they are treated as one program for the purposes of this analysis. The total number of jobs created by these programs is estimated by NYC Recovery to be 13,429 (refer to Figure 3).

Figure 3. Jobs Created by the Build it Back Program³⁹

Program	Jobs Created
Build it Back MultiFamily	2,684
Build it Back Single Family	9,707
Build it Back Workforce Development	26
Build it Back Temporary Disaster Assistance	384
Build it Back Sandy-Impacted Employment	81
Pre-Apprenticeship Union Placements	171
Other Employers	376
Total	13,429

Endnotes

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