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Center for an Urban Future

New York City's Green Economy Opportunity

Realizing the Full Potential for Job Growth and Economic Mobility in the City's Emerging Green Economy

Center for an Urban Future

NYC's Green Economy Opportunity is a publication of the Center for an Urban Future. Researched and written by Eric Raimondi, Sarah Amandolare, Jonathan Bowles, and Eli Dvorkin. Additional research by Dorian Block, Ian Galinson, Justin Lee, Rachel Neches, Yvonne Scorcia, and Charles Shaviro. Edited by Eli Dvorkin, Jonathan Bowles, and Dorian Block. Designed by Stislow Design.

Center for an Urban Future (CUF) is a leading New York City-based think tank that generates smart and sustainable public policies to reduce inequality, increase economic mobility, and grow the economy.

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New York City's Green Economy Opportunity

Introduction

NO PART OF NEW YORK CITY'S ECONOMY HAS GREATER POTENTIAL FOR LONG-TERM GROWTH THAN THE cluster of jobs, companies, and industries known as the green economy. The massive public and private sector investment expected for years to come to reduce greenhouse gas emissions in thousands of buildings, expand infrastructure to enable the switch to electric vehicles (EVs), develop renewable sources of energy, and prepare the city for climate change is expected to sustain 400,000 jobs in the five boroughs by 2040, according to a recent report by the New York City Economic Development Corporation (NYCEDC) and the Mayor's Office of Talent and Workforce Development.

The expected job growth will not only provide a much-needed boost in employment, but also a major new source of middle-class jobs. A flourishing green economy may be the best chance in a generation to expand access to well-paying career opportunities for New Yorkers of color and individuals from low-income communities—many of whom have borne the brunt of environmental injustices for decades.

But while there has been job growth in several parts of the green economy in recent years, our research suggests that New York City's green economy is not yet anywhere close to fully charged. In 2023, for example, there were just 2,184 unique jobs postings in the core green economy in New York City, according to the Center for an Urban Future's analysis of data from labor-market analytics firm Lightcast. While only one other U.S. city had more (Houston, with 3,127), these core green jobs—the jobs that play a direct role in reducing emissions and transitioning away from fossil fuels—accounted for only a small fraction of New York City's job growth. During the same period, there were 70,002 postings in health care, 56,314 in finance and insurance, 46,912 in tech, and 18,318 in the management, scientific, and technical consulting services sector.

Even as the core green economy remains relatively small, a growing number of employers are seeking candidates with a variety of green-related skills—from architects with expertise in designing energy efficient structures to HVAC technicians knowledgeable about heat pumps. In total, employers posted 22,070 jobs in 2023 seeking candidates with specific green skills, up from 19,566 in 2019—a 12.8 percent increase. Notably, most of this growth is located in industries outside the core green economy, including architecture and engineering (+314 annual job postings compared to 2013, finance (+354 postings), and colleges and universities (+491 postings). The exception is electric power, which includes the core green economy industries of solar and wind (+848 job postings).

A majority of the industry leaders and experts we spoke with in New York City's building sector—which, according to NYCEDC, accounts for well over half of all jobs in the city's green economy—say that job creation connected to green economy investments has so far been modest. Indeed, there are clear signs that the pace to electrify buildings has been slow. One of the key components of a building retrofit designed to reduce emissions is the installation of new heating and cooling systems—an undertaking that requires a permit from the New York City Department of Buildings. But Just 2,021 permits to install new heating and cooling systems have been filed since 2017, including only 415 for commercial buildings and 405 for multifamily residential buildings. Similarly, while there has been a notable increase in the installation of heat pumps, less than 1 percent of all housing units statewide have one.

The solar industry has arguably been the fastest growing part of the green economy in the past few years, but our research suggests its rapid growth has accounted for only about 750 new jobs over the past decade. And while the offshore wind industry has the potential to create thousands of jobs in the years ahead, offshore wind firms with a presence in New York City generally have just a handful of employees here today.

But it is by no means a given that New York City will fully unlock the sector's massive potential and create the tens of thousands of inclusive green jobs that are eminently possible. Indeed, this report details 17 specific challenges that are currently holding back job growth in the city's green economy. At the same time, the potential for a major federal pullback from green economy investment poses an additional obstacle to New York's continued growth.

Going forward, city and state policymakers will need to address these barriers. And while government leaders in New York should continue to innovative with new policies and programs, what's needed most is a full court press to make sure New York fully implements key initiatives already underway, starting with the landmark Local Law 97. Meanwhile, to ensure that a significant share of the city's future green economy jobs are accessible

Core Green Jobs Account For Small Fraction of New York City Job Postings

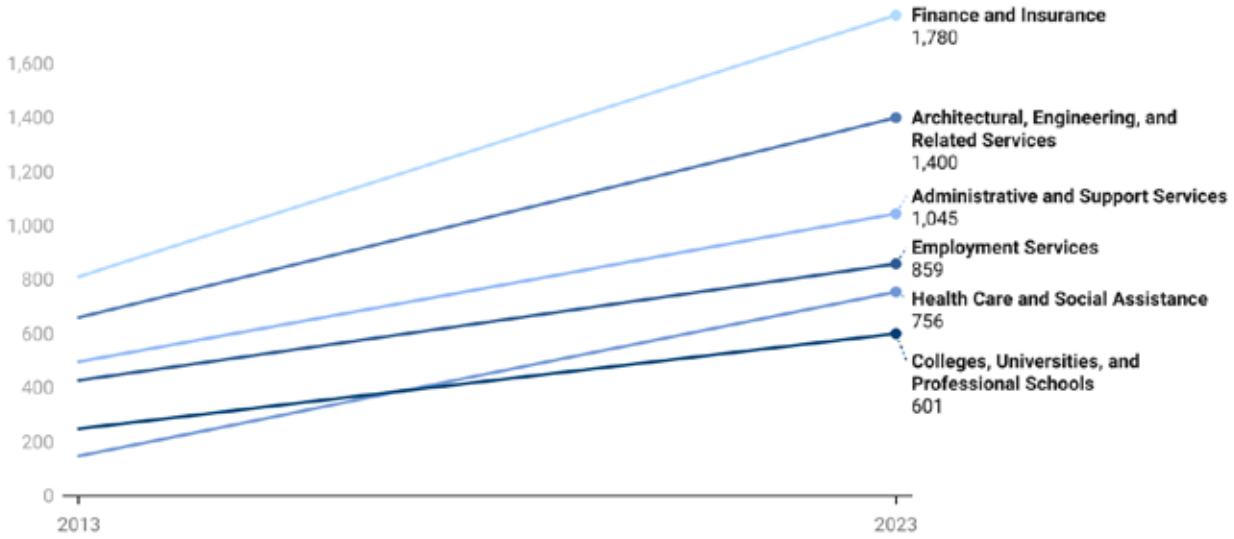
Total Job Postings by Industry, 2023

Industry	▲ Job Postings
Core Green Economy	2,184
Management, Scientific, and Technical Consulting Services	18,318
Tech	46,912
Finance and Insurance	56,314
Health Care	70,002

Source: Center for an Urban Future analysis of data from Lightcast. Created with Datawrapper

Much of the Growth in NYC's Green Jobs Have Been Outside of the Core Green Economy

2013 to 2023



Source: Center for an Urban Future analysis of job postings data from Lightcast. Created with Datawrapper

to New Yorkers of color, New York policymakers will need to support the city's small but growing ecosystem of green economy workforce training organizations and the City University of New York (CUNY), and set them up with the resources, data, and employer insights needed to succeed.

Supported by a grant from JPMorgan Chase, this report provides a new level of detail about the emerging green economy in New York City and the workforce development system now in place to prepare New Yorkers for these jobs. The report, which was informed by more than 150 interviews conducted through August 2024 with company leaders, human resource directors, climate policy advocates, industry and trade association leaders, sustainability finance experts, leaders of workforce development programs and other education and training providers, and New York City and State government officials, is organized into two main parts:

- **Green Economy Job Growth Shows Major Promise but Is Still in the Early Stages of Development.** Based on dozens of interviews with small and large employers across the city's green economy, it unpacks where job growth is already occurring in green economy fields, details the types of jobs that are being added, and fleshes out which areas employers anticipate growing over the next few years. Importantly, it shines a light on 17 of the most important challenges to job creation in New York City's emerging green economy.
- **Realizing the Potential of New York City's Green Jobs Training Ecosystem.** The report features the first interactive map of workforce development providers programs that are preparing candidates for green economy jobs in New York City, with data-backed profiles of 32 training and education programs. (See page 35). Although the landscape of providers and programs is complex and evolving quickly, this report offers the most detailed snapshot to date of New York's existing green economy workforce programs. This part of the report also includes new analysis about strengths, weaknesses, gaps, and opportunities in the city's green jobs training ecosystem.

Much of this report focuses on the opportunity to connect New Yorkers from underserved communities to well-paying jobs in the emerging green economy. But there will be limited opportunities for New Yorkers in the green economy if the city doesn't maximize the potential for job creation. Our research identifies 17 specific challenges that are either already holding back job growth in the city's green economy or which will likely limit future growth if not addressed.

The 17 challenge areas, which are outlined in more detail later in the report, include:

- Electrifying buildings is one of the best opportunities to create new green economy jobs, but only a tiny fraction of commercial and multi-family buildings in NYC have taken this step.
- The economics of undertaking Local Law 97-mandated building retrofits have gotten more challenging for many property owners due to rising interest rates and hybrid work.
- The current penalty structure for buildings not meeting Local Law 97 requirements is unlikely to incentivize widespread compliance.
- A shortage of electricians and HVAC technicians threatens to limit the number of buildings retrofits, and slow solar installation projects.
- Not enough property owners are accessing the technical assistance that exists to support building retrofits.
- The state's limited transmission capacity will make it difficult to electrify thousands of buildings and support a broad-based shift to electric vehicles.
- Renewable energy needs to be connected more swiftly to the city's electric grid to meet growing demand.

- The city lacks affordable and accessible space for electric vehicle charging development.
- Current infrastructure for electric micromobility is inadequate.
- The cost of electric vehicles is still too high to incentivize broader adoption.
- The city and state can do more to enable the uptake of solar across its one million buildings.
- New infrastructure is needed to enable the city to grow as an offshore wind servicing hub.
- "Onshore" trades will need to be re-skilled to do "offshore" work.
- Financing offshore wind and other clean energy projects has become more challenging.
- The city lacks the space for a localized sustainable waste management sector.
- The city lacks the mandates and incentives that would create a more robust market shift to sustainable waste management.
- Budget cuts to community composting will slow progress toward organics diversion.

Addressing these challenges will be key to boosting future job growth in the city's green economy. But simply creating jobs is not sufficient. Additional actions will also be needed to ensure that New Yorkers of color and those from low-income backgrounds are able to access the well-paying jobs being created.

Fortunately, New York City is home to dozens of workforce training programs that prepare unemployed and underemployed New Yorkers for a range of green-economy jobs, including programs at CUNY. But our report also identifies some challenges gaps in this training ecosystem, including:

- Given the relatively modest size of the green economy today, there is a risk that without significant and sustained growth, providers could end up training candidates for jobs that don't exist.
- If providers have the data and insights needed to align programs with demand, there is untapped potential to prepare more New Yorkers for many of the jobs outside the core green economy that are increasingly in search of candidates with green-related skills. But many of these roles typically go to candidates with college degrees, making CUNY's role particularly critical.
- Most of New York City's green workforce training programs are small in scale. We identify 32 organizations offering at least 45 unique green economy training programs today, serving a total of about 7,900 New Yorkers each year—or about half of the total number of jobs seeking candidates with green skills annually. But four programs alone account for more than half of the total slots (4,477), and 17 programs serve under 100 New Yorkers annually
- New York's green workforce training programs are more heavily concentrated in Manhattan and Brooklyn.
- More than half of New York City's green job workforce training programs have a focus on construction and building operations, and those programs cannot keep up with demand.
- Over the next five years, training organizations anticipate escalating need for new workers who can electrify buildings, manage building automation controls, conduct energy audits, and work in offshore wind.
- Funding is needed to upskill experienced, existing workers whose jobs are changing.
- Several training programs are struggling to cover the cost of stipends, as well as provide wraparound services for participants.

The good news is that the administrations of Mayor Adams and Governor Hochul, as well as the City Council and State Legislature, have all taken major steps to foster a stronger and more equitable green economy. The Adams administration's Green Economy Action Plan, released in February 2024, details 63 city commitments to help make New York a global leader in the green economy while integrating talent development—a major step forward in the city's approach to cultivating equitable economic growth. This includes promising new efforts to help prepare New Yorkers for green careers, including the establishment of green

training facilities in every borough. Governor Hochul has greenlit several efforts to meet the state's ambitious climate goals, including an action plan to expand the renewable energy sector and obtain 70 percent of the state's electricity from renewable sources by 2030.

However, even more is needed at the state and local level, especially given the likelihood that the federal government may significantly curtail investment in the sector in the years ahead. This report's top policy recommendation is not to launch a shiny new initiative, but rather to pull out all the stops to ensure full implementation of Local Law 97, ensuring that thecity is actually producing the jobs needed to realize the opportunity for new green economy careers and upward economic mobility. On the workforce side, the mayor and City Council will have to allocate ample funding in upcoming budget cycles to implement the key commitments in the Green Economy Action Plan, starting with fully funding the borough-based training centers.

A second key recommendation is to better leverage the City University of New York (CUNY) by launching a major new capital investment to build a greener university, combined with a first-of-its-kind initiative to tap CUNY's students to achieve this—preparing them for green economy careers in everything from architecture, engineering, and materials science, to finance and capital planning, to the building trades.

Crucially, these investments will have to work in tandem with policies designed to overcome the many barriers that exist to further job growth, or else run the risk of training New Yorkers for jobs that fail to materialize. Among other things, New York should launch a green economy data dashboard to help workforce development organizations better understand the growth potential of the green economy at the level of specific sub-industries and occupations, and to ensure that economic and workforce development investments are closely aligned.

This report details the opportunity blooming in the city's nascent green economy, provides analysis of the most pressing challenges that stand in the way of realizing job growth, examines the current size and scope of green economy-aligned workforce training programs, and concludes with achievable recommendations for realizing the full potential for job growth and economic mobility in New York City's emerging green economy.

The Adams Administration's Commitments to Growing the Green Economy and Expanding Access to Green Economy Jobs

The Adams Administration has made 63 commitments to foster a larger and more inclusive green economy in the years ahead through its "Green Economy Action Plan." Released in February 2024, the plan includes the ambitious, long-term promise that the city will nearly triple the number of green-collar jobs to 400,000 by 2040, and concurrently train and position New Yorkers, especially those from economically disadvantaged and environmental justice communities, to enter these emerging career pathways. If accomplished, green-collar jobs will be 7 percent of all jobs, and the sector's expected GDP output could nearly triple to $89 billion annually.

The commitments include several major public investments to spur job creation, including a collective $725 million investment—by NYCEDC, the Brooklyn Navy Yard, and the Trust for Governors Island—to activate a massive Harbor Climate Collaborative, which will link private and nonprofit partners over 72 acres across New York Harbor. The investment aims to catalyze climate education, research, commercialization, and workforce development, promising to support 5,000 new jobs and generate $55 billion of economic impact. This includes the $100 million Climate Innovation Hub at Brooklyn Army Terminal, which aims to help grow more than 150 green technology startups and businesses and create 600 jobs, generating $2.6 billion of economic impact.

In addition, the city made several commitments which are intended to spur more private sector investment, such as activating public sites for electric vehicle (EV) charging, including two acres of land near JFK airport, and space throughout the Brooklyn Navy Yard campus, and utilizing tax incentives to activate up to 500 megawatts of battery storage capacity by 2025. The city reports that this effort has induced approximately 254 megawatts of storage capacity to date, generating more than $400 million in private sector investment by leveraging discretionary tax benefits through the city's Industrial Development Agency. NYCEDC is also investing to help develop the South Brooklyn Marine Terminal into a state-of-the-art wind facility—an investment that combines a major private investment by the energy company Equinor with $126 million in New York State funding.

As a part of the Green Economy Action Plan, the city also announced 7 key commitments around talent development and expanding access to green economy jobs, led by the Mayor's Office of Talent and Workforce Development. Most notable is the city's commitment to develop green workforce training facilities in every borough, which will support a larger goal of creating 12,000 green economy apprenticeships by 2040. NYCEDC has also announced a $10 million capital investment in improving CUNY's offshore wind training program, and other green economy–focused programs at CUNY.

Prior to the Green Economy Action Plan, the Adams administration also made a number of important commitments and policy changes intended to grow the green economy, including by launching the City of Yes for Carbon Neutrality zoning reform package, by mandating that all New York City vehicles be zero emission vehicles by 2035, and by committing to several new initiatives to support the implementation of Local Law 97. Since the plan's release, the Adams administration has also announced a new $15 million federal grant to add 600 chargers to New York City streets, including more than half in low-income neighborhoods, and 32 solar-powered charging ports at eight NYC Parks locations.

Helping More Minority and Women-Owned Business Enterprises Benefit from Green Economy Growth

As the green economy grows, NYCEDC is taking steps to ensure more of the businesses that benefit from additional investment and spending are minority, women-owned, and/or disadvantaged business enterprises (M/W/DBEs). These efforts include the following three promising initiatives, all of which have room to grow:

The ConstructNYC program has connected more than 10 cohorts of small-to-mid-sized minority/women-owned and otherwise disadvantaged business enterprises with exclusive opportunities to work on NYCEDC projects through contracts of up to $3 million, and also to the $4 billion pipeline of projects through the Department of Citywide Administrative Services (DCAS). After a pre-qualification process, businesses have to compete against similarly-sized businesses for NYCEDC contracts, but the program allows them to also receive fast-tracked payments and access to capital to prevent cash-flow issues, receive technical assistance, and access trainings. In 2022, the program with only NYCEDC was expanded to connect to other agencies, including DCAS, which has a pipeline of over a dozen large-scale energy efficiency retrofits and hundreds of energy audits of city-owned property, with the goal growing more M/W/DBE business capacity for sustainability-focused projects.

The NYC Waterfront Pathways Program is a $1 million program launched in March 2023 by NYCEDC to counter documented disparities in public procurement by increasing opportunities for M/W/DBEs in the offshore wind industry and many projects along the waterfront connected to the green economy. Prequalified businesses will compete against similarly sized businesses for NYCEDC contracts, receive technical assistance, and have access to training by and networking with industry experts. The city estimates that the offshore wind sector is poised to employ over 5,000 New Yorkers by 2030, and has committed to ensuring that 40 percent of job and investment benefits will be directed to women, minorities, and environmental justice communities. The first cohort of the program in 2023 consisted of 18 construction and professional service firms.

WeSource NYC is a technical assistance and communications program launched in June 2024 that will support local small- and medium-sized manufacturers, construction service providers, and industrial equipment suppliers to capture contract opportunities in the growing offshore wind supply chain. New York aspires to become a leading destination for the industry, with many of the 8,200 anticipated new jobs through 2040 generated in the manufacturing and construction phases of development. This growth is already underway in 2024, with the start of construction on what will be the country's largest dedicated offshore wind port at the South Brooklyn Marine Terminal in Sunset Park, Brooklyn. The city, and multinational energy company Equinor, have committed to a goal of 30 percent of project opportunities going to M/W/DBEs.

Green Economy Job Growth Shows Major Promise, but Is Still in Early Stages of Development

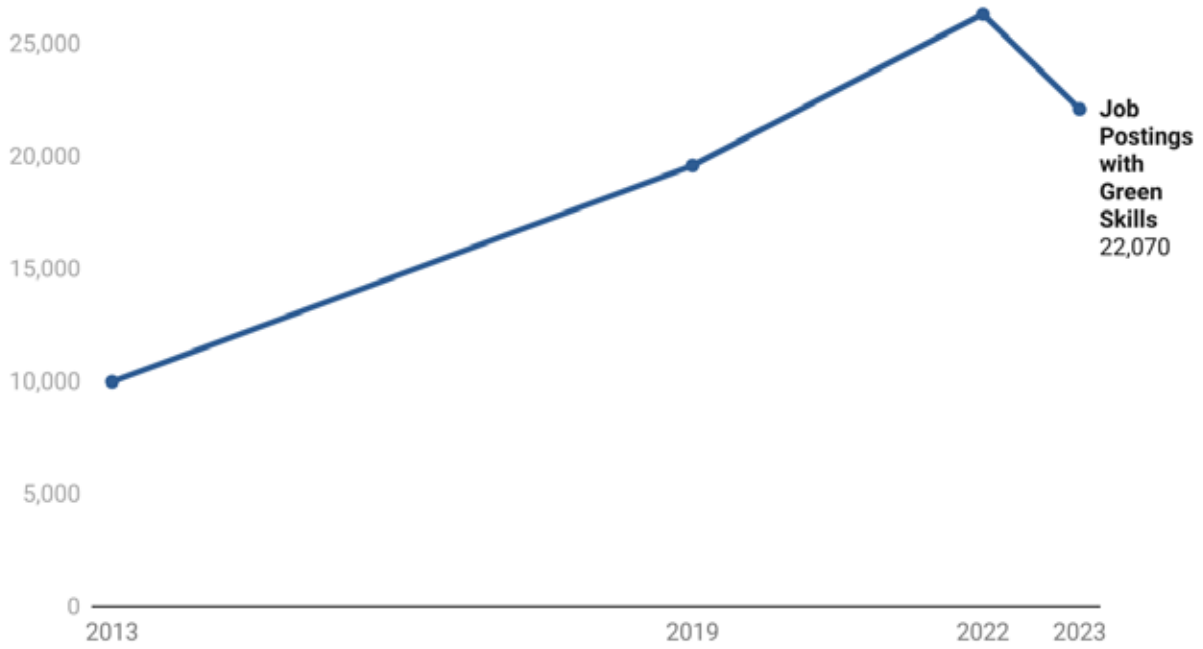
THE RECENT REPORT FROM NYCEDC PROJECTS THAT THE CITY WILL HAVE 400,000 JOBS IN THE GREEN economy by 2040, up from 130,000 today. Our own research shows that there has already been notable job creation in parts of the city's green economy. At the same time, in much of the green economy—including the buildings sector, which arguably has the most future potential for job growth—the job growth has thus far been more sporadic. And much of this growth is contingent on existing jobs becoming significantly greener—in fact, NYCEDC projects that only about 75,000 of these 400,000 jobs will be newly created between now and 2040.

The Center for an Urban Future's analysis of job postings data in New York City underscores both the opportunities and challenges facing the city's green economy in recent years. Over the past decade, New York City has experienced a surge in job postings seeking individuals with skills related to green economy jobs, from thermal modeling and green building skills to experience with photovoltaic systems and wind turbines.[1] In 2023, 4,485 employers published a total of 22,070 unique job postings seeking candidates with green skills across the five boroughs—up from 19,566 in 2019, a 12.8 percent increase.

Over the past decade, unique postings seeking green skills grew by 105.2 percent, more than doubling from 7,555 in 2013. Despite this promising growth, the number of green jobs postings declined between 2022 and 2023 (from 19,476 to 15,501), suggesting that the sector's consistent year-over-year growth is far from assured.

Unique Job Postings Seeking Green Skills

While there has been a lot of growth in the last decade, a recent downtick suggests that continued rapid growth is far from assured.



Source: Center for an Urban Future analysis of job postings data from Lightcast. Created with Datawrapper

A few industries lead the city when it comes to the number of job postings seeking green skills—and most are outside the core green economy. These include architecture and engineering (1,815 job postings seeking green skills in 2023), colleges and universities (1,232 postings), employment services (1,085), finance and insurance (1,068), electric power generation (1,061), hospitals (566), and consulting services (547).

The following helps to illustrate some of the job growth in the green economy that has occurred in New York City:

Buildings: There are signs that job growth is picking up in the building sector, where the push to comply with Local Law 97, the promise of cost-savings that come with energy efficient buildings, and the opportunity to appeal to sustainability-conscious investors and tenants is driving demand for energy audits, decarbonization investments, and major retrofits, as well as the construction of new, more efficient buildings. Over the past decade, the number of NYC buildings with LEED certification—the most common green building rating system—increased from 800 buildings in 2013 to over 1,500 in 2023—an 85 percent increase.[2] And thousands more buildings are planning or have undertaken at least one decarbonization project in recent years, according to data from the city's Department of Buildings.

The phase-in of Local Law 97 is arguably the leading factor, with about 60,000 affected buildings facing a mandate to reduce emissions sharply by 2030. More property owners are moving to install new heating and cooling equipment, updating their building envelopes, and implementing energy-saving building management systems, all of which are driving up demand for workers in HVAC, electrical engineering, construction, and building operations. Importantly, all of this has started to have a significant impact on jobs. For example:

- CoolSys Energy Design, a building systems engineering consultancy focused on building decarbonization, has nearly doubled its workforce from more than 50 to more than 100 over the past few years.
- Bright Power, an energy efficiency and renewable energy solutions provider, has added 32 new employees last year, doubling the size of some service delivery teams.
- Goldman Copeland, an engineering firm that specializes in energy efficiency upgrades in major commercial buildings, reports significant growth in the last few years, adding 58 employees (from 12 to 70).
- Mosto Technologies, a firm that specializes in making steam heating systems more energy efficient, went from 5 to 9 employees since 2019, and plans to double their staff in the next five years.
- Grumman Butkus Associates, a firm focused on sustainable building design, added 7 employees in the last five years (from 20 to 27).

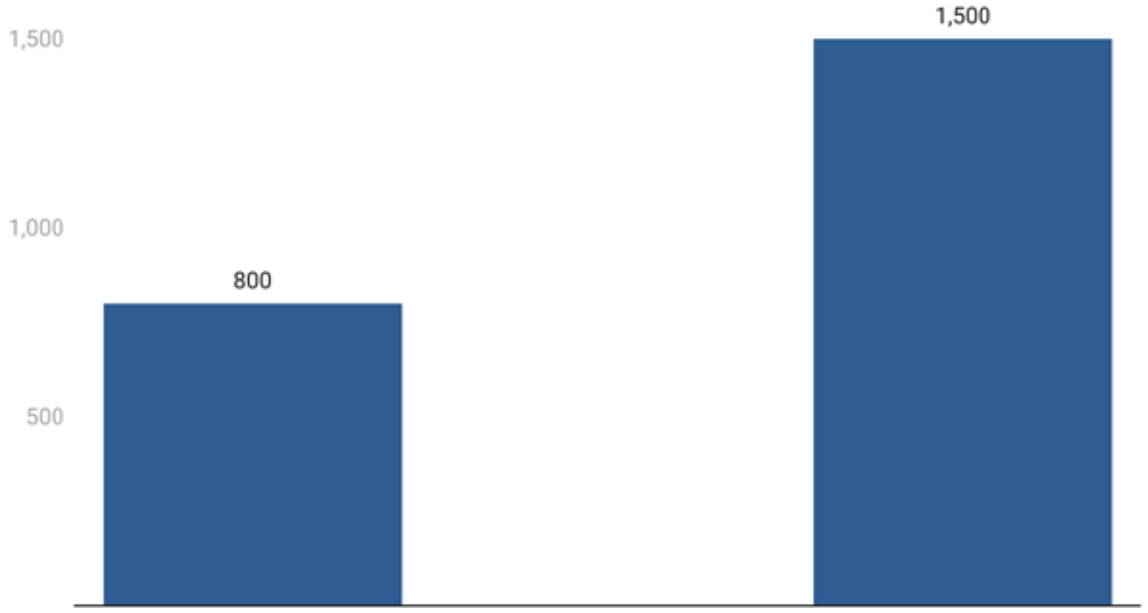
Solar: New York City is experiencing a solar boom, with over 50,000 solar systems installed across the boroughs and more than 4,300 jobs in the city's solar industry as of 2023, creating job opportunities in sales, installation, electrical trades, customer support, and tech roles. For example:

- NineDot Energy, an energy storage company founded in 2015 and based at NYU's Urban Future Lab, increased its employee count from 4 to 50 over the past five years, and was on track to exceed 60 by the end of 2024. The company is the first in the city to install community-scale energy storage systems, with its first project completed in the Bronx in 2022. Brooklyn Solar Works, a residential solar installation company founded in 2015, has completed nearly 2,000 system installations across the five boroughs, increasing its employee headcount from 20 to 80.
- Urban Energy, which was founded in 2017 and has installed community solar systems across the city (included on several New York City Housing Authority campuses), increased its employee headcount from 2 to 30 over the past seven years.

Clean and Alternative Transportation: The growth of electrified transportation, in the form of personal EVs, battery-powered fleets, and expanded micromobility adoption, is leading to growth in the city's economy. There are now 70,000 registered EVs in the city and a growing presence of e-bikes and e-scooters, although experts say this is just a fraction of the 400,000 electric vehicles that policymakers would like to see replace fossil fuel-powered vehicles by 2030 to achieve the

Buildings With LEED Certification Rise By 85 Percent Over Decade

Total buildings with LEED certification increased from 800 in 2013 to over 1,500 in 2023.



Source: Center for an Urban Future analysis of data from USG BC. Created with Datawrapper

city's climate goals.[3] To meet current demand and induce more, the city's charging infrastructure is also expanding, with significant new investments underway, although there remains significant further room to expand. Today, there are around 800 public charging stations across the five boroughs, according to data from the New York State Energy Research & Development Authority (NYSERDA), with plans to build thousands more in the coming years.

- Revel, an all-electric ride hailing company, has grown from 40 employees in 2019 to 1,432 employees as of 2023, becoming one of the city's fastest-growing companies in the process.
- EV charging startup Gravity, founded in 2021, has 10 projects in the pipeline, employing dozens of workers per site.
- Citi Bike has expanded to over 2,000 stations and 30,000 bikes, doubling its workforce since 2018 to over 1,000 during peak season.
- Tesla's Brooklyn service center is experiencing a surge in demand for EV service technicians, with 12 job openings as of October 2023.

Sustainable Waste Management: The sustainable waste management sector forms a much smaller but still important part of the emerging green economy, encompassing a range of companies and nonprofit organizations building environmental, economic, and social considerations into waste management services. New York City's private sector is beginning to embrace greater sustainability in waste management, sparking job growth among companies that aim to replace single-use supplies with reusable ones, divert usable materials from the waste stream, and expand recycling and composting efforts.

- Job opportunities in recycling and composting have grown. Over the past three years, New York City employers posted 834 recycling- or composting-related job postings, up from 509 in the 2017 to 2019 period—a 64 percent increase.[4] Public sector initiatives, such as curbside composting and the "Zero Waste" legislative package, further support sustainable waste management practices and are spurring some job growth.
- The reuse company Re:Dish, which helps corporate and school cafeterias shift from single-use to reusable containers, had just

a handful of staff in 2022. In July of 2024, the company had over 20 staff.

- The city's municipal recycling provider has experienced an uptick in employment. Iveth Dias, the HR director for the Sunset Park facility, the largest materials recovery facility in North America, says her company has added 25 additional employees in the last few years and now has 110 people on staff.

The Opportunity for Future Green Job Creation in NYC

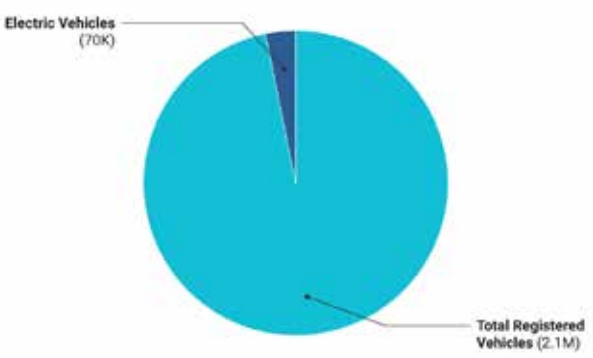
While many employers in the city's emerging green economy have already been hiring at a rapid clip, our research suggests that these hiring trends will likely accelerate. At the same time, more than two dozen companies we interviewed for this report say that they anticipate quicker growth in the coming years than over the past five years—if policies, investments, and market conditions align to maintain this more rapid growth trajectory.

The following helps to illustrate some of the job growth that New York City's green economy companies have planned for the near future, with by far the most growth potential concentrated in the buildings sector:

Buildings: With LL97-specified limits on the greenhouse gas emissions of buildings starting to take effect in 2024, industry experts expect a wave of new hiring as more buildings invest in retrofits and other upgrades to comply with the law. Vornado, the city's largest private building owner, has earmarked over $100 million for upgrades such as LED lighting and building automation. Two of the city's other largest property owners, Blackstone Group and Columbia University, have respectively pledged $100 billion globally and $100 million city-wide for sustainability upgrades.5 Investments by these and other building owners will almost certainly spur significant job growth in the coming years, most often at contracting firms that specialize in building upgrades. According to our research:

CoolSys aims to add another 50 employees in the next five years (going from 150 to 200), driven by demand for the electrification of major buildings' heating and cooling systems.

Just 3.2 Percent of Registered Vehicles Are Electric in New York City



Last updated November 2024.
Source: Atlas Public Policy. Created with Datawrapper

BONDI Energy, a Canadian building retrofit company founded in 2019 that has a significant presence in NYC, plans to grow its employee headcount from 5 to 35 over the next three-to-five years.

Retrofit projects, which rely heavily on electricians and HVAC technicians, are also creating job opportunities in traditional building and construction trades. Of the more than 30,000 job postings in the construction industry since the pandemic, 5,500 were in HVAC while nearly 5,000 were in electrical contractors and installation, together accounting for a third of all jobs in the industry.[6]

Solar: New York City's high electricity costs, vast rooftop spaces, attractive federal, state, and local incentives are driving the rapid adoption of solar power technology. Companies like Brooklyn Solar Works and Urban Energy anticipate significant expansion in the years ahead, leading to new jobs for electricians, estimators, installers, customer support, and technology. Technical skills are particularly in demand, reflecting the need for specialized expertise in electrical work, battery storage, and photovoltaic systems.

- In the coming few years, Brooklyn Solar Works is projecting to double its current headcount, going from 80 to 160 employees.
- Urban Energy has plans to significantly expand its staff, increasing its employee headcount by 120 (from 30 to 150).

Clean and Alternative Transportation: In the transportation sector, the city and state are pushing for widespread electrification of gas- and diesel-powered cars and trucks, while the popularity of e-bikes and scooters surges, creating opportunities in EV maintenance and charging infrastructure. Companies like Gravity and Flo foresee exponential growth over the next five years, generating thousands of jobs in installation and operations. Moreover, initiatives like the Blue Highway proposal are expected to drive demand for electric cargo bikes and trucks, creating some new jobs in freight transportation alongside the electrification of existing jobs (like diesel and bike mechanics).

- The EV ride-share company Revel has plans to hire 300 more employees by 2025, up from 1,432.
- Gravity, the EV charging developer founded in NYC in 2021, has plans to scale its operations tenfold in the next three to five years, "generating thousands of jobs" in installation and operations and maintenance.
- Lime, a global electric scooter-share company, hopes to nearly double its local staff, from about 60 to over 100 employees, if the city expands its e-scooter-share program beyond the Bronx and Queens pilots launched beginning in 2021.

Offshore Wind: In the years ahead, the development of offshore wind projects presents significant employment opportunities, with companies like Heerema and Aker Solutions anticipating substantial hiring. Local suppliers and workers are crucial to support installation efforts, contributing to job growth in various construction trades. And while few of these jobs exist here today, industry leaders are planning to hire for job openings in wind farm management, turbine maintenance, and logistics in the months and years ahead.

- Heerema, one of the offshore installation contractors for the state's massive Empire Wind 1 project, expects to employ dozens of local welders, riggers, and other construction trade workers on their marine vessels while the project is installed, up from only one city-based employee today.
- Aker Solutions, which has been contracted by the offshore wind company Ørsted to help develop the Sunrise Wind project off Long Island, underscored the need for skilled workers in scaffolding, welding, cable splicing, and other construction trades. The Sunrise Wind project will create an estimated 800 construction jobs and 300 ongoing roles in maintenance and operations.
- Rise Light & Power, a Queens-based clean energy developer and energy asset manager, has plans to convert the Ravenswood Generating Station—the city's largest power plant—from a traditional fossil fuel burning facility into a hub for clean energy, starting with offshore wind. This long-term plan will eventually require the re-skilling of the facility's 100+ workers, as well as additional hiring for a new operations and maintenance port that will service the offshore wind industry.

Sustainable Waste Management: Though still a small industry, efforts to transition to a more sustainable waste management system are underway, leading to job creation in the recycling, composting, and reuse industries. Waste management firms and private recycling facilities are expanding their workforce to accommodate increased demand. The reuse industry, in particular, holds significant potential for growth, with opportunities in reusable building materials, containers, textiles, technology, and other areas. As policymakers and advocates pursue a more circular economy, diverse job opportunities are emerging, ranging from waste auditors to equipment technicians.

The reuse company Re:Dish has plans to grow by another 40 staff in the next few years.

The company Cup Zero, which provides reusable cups for festivals and events, will nearly double its New York staff to 30 people in the next few years. EWG Glass Recovery and Recycle Corp, a private glass recycler based in Jamaica, planned to open a new facility in 2024 and hire an additional 10 staff as demand for its services grows.

The city's own five-borough curbside composting program is expected to create over 320 jobs at the Department of Sanitation, as well as a similar number of additional private sector jobs as composting vendors are selected in the years ahead.

17 Key Challenges to Maximizing Green Job Creation in NYC

Electrifying buildings is one of the best opportunities to create new green economy jobs, but only a tiny fraction of commercial and multi-family buildings in NYC have taken this step.

In our research, we consistently heard that the electrification of buildings presents one of the best opportunities for job creation in the building sector. Achieving the city and state's bold emissions reduction targets will almost certainly require many large office and residential buildings to electrify their building systems by 2030—a massive undertaking in a city with more than 528 million square feet of office space and tens of thousands of multifamily residential buildings.

The opportunity is clear. If the implementation of Local Law 97 functions as intended, thousands of large buildings will need to reduce their emissions 40 percent by 2030 and to net zero by 2050, driving a surge in demand for major building retrofits. In anticipation of these changes, NYCEDC forecasts that 34 percent of green job growth through 2040 will stem from the decarbonization and electrification of the building industry—comprising 40 percent of all jobs in the city's green economy.

But despite these promising projections, the pace of electrification remains sluggish—especially among large commercial and residential buildings. "To date, there are very, very few multifamily buildings fully electrifying their fossil fuel heating systems," says Richard Yancey, executive director at the Building Energy Exchange, a nonprofit dedicated to connecting the city's building industry and design communities to advance energy efficiency. "The only way to comply [with LL97's targets] is to electrify about 20,000 buildings in the next 10-15 years," says an executive at the Real Estate Board of New York (REBNY). "I think we probably electrify 10 buildings a year right now. Maybe 50."

Although there is no single source of data on the electrification of major building systems in New York City, several findings underscore the challenge facing New York City. One of the key components of a building retrofit designed to reduce emissions is the installation of new heating and cooling systems—an undertaking that requires a permit from the New York City Department of Buildings. But just 2,021 permits for HVAC wiring have been filed since 2017, including only 415 for commercial buildings and 405 for multifamily residential buildings.[7] And while NYSERDA has helped to incentivize the installation of more than 58,000 residential heat pumps statewide, that accounts for less than 1 percent of all housing units in the state. The city's Department of Buildings estimates that approximately 15,000 buildings will require investments totaling $12 to $15 billion to align with the law's 2030 targets.

Meanwhile, there are huge disparities in the number of heat pumps installed through the incentive program Clean Heat. The Bronx, for example, only accounted for 5 percent of all installations from 2020 to 2023—or 1,413 of 26,029—compared to Queens (11,136) and Brooklyn (10,477). The pump installations are similarly lagging in multifamily and commercial buildings, which only accounted for 3.5 percent (915) of all installations. Fully 96.5 percent (25,114) were smaller residential installations.

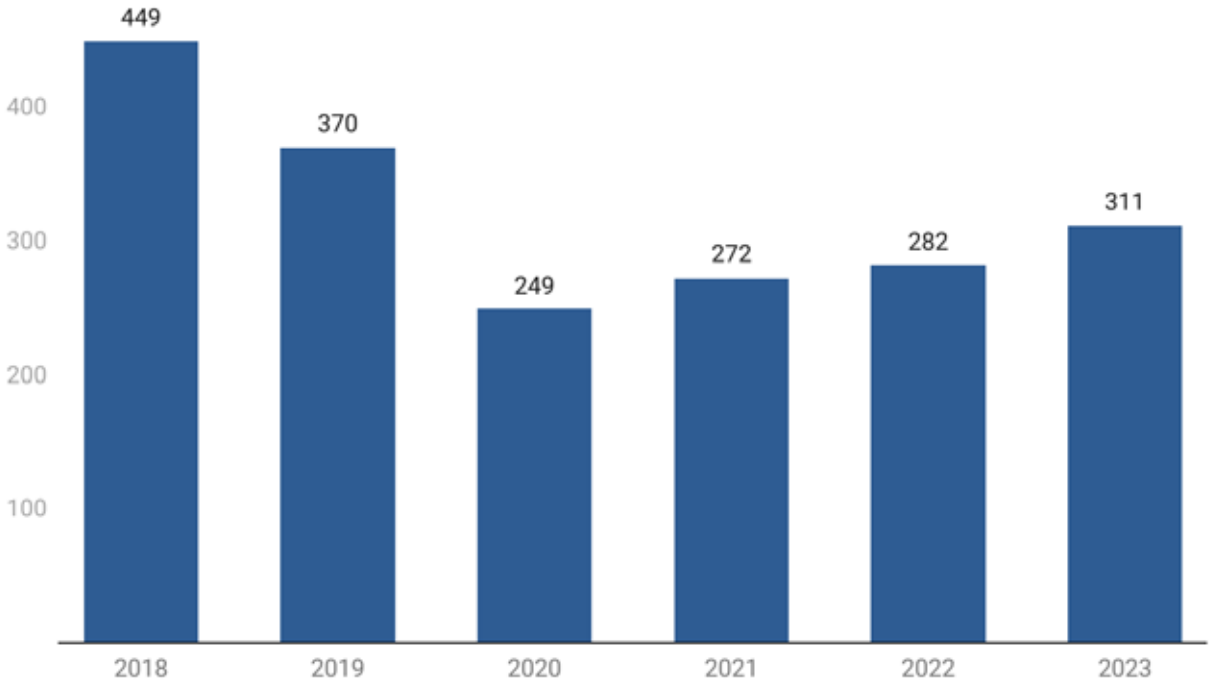
This report finds three key challenges are contributing to the relatively slow pace of major building electrification to date:

- The deep and costly retrofits needed to comply with 2030 emissions reduction targets and the higher operating costs to heat and cool buildings that do not generate their own electricity;
- The question of how to deal with tenants; and
- The shortage of skilled workers and specialists to deliver electrification and massive retrofit projects.

Local Law 97 requires major retrofits that go well beyond a typical energy audit. Industry experts generally say that much of the low-hanging fruit in building energy efficiency has been achieved—such as LED lighting, insulation upgrades, and more automated building management systems—all of which can net a relatively quick return on investment. But reaching the much deeper emissions reductions targets that phase in beginning in 2030 will require far deeper retrofits that could take decades to generate a return on investment in the form of long-term energy savings.

New York City HVAC Wiring Applications, 2018 to 2023

HVAC wiring make up less than 1 percent of of electrical permit applications.



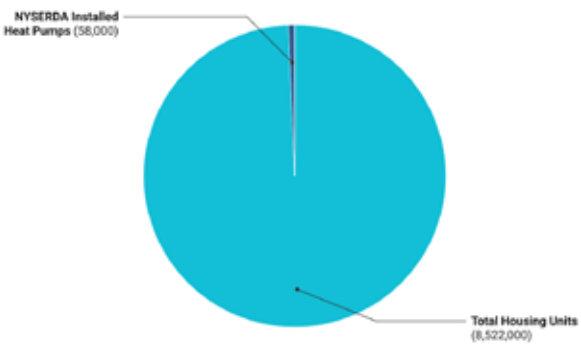
Source: Center for an Urban Future analysis of data from the NYC Department of Buildings. Created with Datawrapper

On top of that, these major retrofits will cause major disruptions to tenants, a reality that makes timing these upgrades a formidable challenge. Unlike switching out fixtures or insulating pipes in the boiler room, electrifying heating and cooling systems in large buildings typically requires "going into people's rooms and ripping out walls and invasive work," says one real estate leader. Overcoming the hurdles of retrofitting with tenants in place poses significant challenges, including coordinating project timelines with lease turnovers and other capital upgrades, and managing temporary loss of rentable space. And with many buildings in challenging financial situations as mortgages come due, the loss of rent during a period of major building upgrades poses an additional financial disincentive.

Moreover, New York City will need more skilled workers of all kinds to carry out these retrofit projects. From electricians and energy auditors to engineers, a shortage in skilled labor persists, impeding the widespread adoption of electrification technologies. For "an estimator, an engineer, a project manager, or an HVAC engineer, it's hard to find good experience," says Joe Guerra of Ainsworth, a company that specializes in

NYSERDA Installed Heat Pumps Account For Less Than 1 Percent of All Housing Units in New York State

NYSERDA has made rapid progress incentivizing the installation of heat pumps across the state, but has still reached just 1 percent of total housing units as of 2023.



Source: Center for an Urban Future analysis of data from New York State Energy Research and Development Authority. Created with Datawrapper

technical trades like HVAC, mechanical, and electrical engineering. Industry experts also cite knowledge gaps around specific aspects of the electrification process, such an interconnection for new renewable energy and battery storage projects with the city's current grid. Several industry leaders say that only a handful of engineering firms with a presence in New York are experienced in this once-niche but now fast-growing part of the green economy.

At the same time, the transition to new technologies like heat pumps necessitates reskilling for key workers like HVAC technicians and building operators as well as training specialists, a challenge exacerbated by industry hesitancy and a dearth of expertise. "There has been hesitancy…to transition from familiar fossil fuel equipment [and] to [train] and [adapt] for heat pumps and newer technology," says Amanda Clevinger of Bright Power, an energy solutions provider that specializes in sustainability. Without the necessary workforce and expertise to install new technologies and assist in building electrification, the path to full LL97 compliance will be challenging to achieve at scale.

Number of Heat Pumps Installed through NYS Clean Heat in NYC, 2020–2023

	Residential	Multifamily	Commercial	Total
Bronx	1,267	115	31	**1,413**
Brooklyn	10,477	300	169	**10,946**
Manhattan	271	60	76	**407**
Queens	10,982	64	90	**11,136**
Staten Island	2,117	—	10	**2,127**
Total	**25,114**	**539**	**376**	**26,029**

Source: Center for an Urban Future data analysis of data provided by Con Edison.

The economics of undertaking LL97-mandated building retrofits have gotten more challenging for many property owners due to rising interest rates and hybrid work.

Major building retrofits to comply with Local Law 97 typically cost millions of dollars. For a 50-unit multi-family building, retrofit projects can cost anywhere from $1 million to nearly $3 million. And for a 150,000 square foot office building, the cost to retrofit can range anywhere from nearly $2 million to more than $3.5 million. While some Class A[8] commercial and luxury rental buildings may have the working capital and credit facilities to finance this transition themselves, it is a highly challenging lift for many other buildings. And the economics have only gotten more difficult in the past couple of years, with higher interest rates making it significantly more expensive to borrow capital for building upgrades. On top of this, scores of office building owners, especially those who own Class B and C buildings, are in dire financial straits as a result of hybrid work, higher interest rates, and a shift among office tenants toward spaces with more amenities. This has caused occupancy rates to plummet to their lowest levels in decades for many buildings, and driven a significant share of buildings to incur past-due balances on their loans. For instance, the delinquency rate for Manhattan office buildings increased from 0.57 percent in January 2023 to 6.28 percent in January 2024. With no full recovery for office occupancy in sight, office vacancy rates in Manhattan reached nearly 23 percent in early 2024, up from 11 percent in 2019, while in Brooklyn, office vacancy rates stood at 23 percent.

Meeting the city's emissions and jobs goals will be nearly impossible without substantial participation from across the commercial sector, including owners of Class B and C buildings. But our research suggests that few of those building owners see themselves as able to pursue major retrofit projects today.

"[Class B and C buildings] operate on tight margins in general and don't have the resources to effect this change," says Richard Yancey of the Building Energy Exchange. As is, Class B and C buildings across the city are struggling to maintain their financial footing.

"These buildings are in a very difficult position. For example, the garment district, where our office is, was

hit hard during the pandemic, and has a relatively high vacancy rate (~50 percent). Here, and for similar commercial buildings in hard hit neighborhoods, financing the necessary retrofits is a very hard ask," says Steve Mosto of Mosto Technologies Inc., an energy consulting company that implements energy efficient solutions within buildings. Programs like NYSERDA's Empire Building Challenge (EBC), which is investing $50 million to pilot low-carbon retrofits that are economically and technically feasible, are a promising start. But these efforts remain small in scale. EBC, for instance, has completed just ten pilot projects to date.

Multifamily residential buildings—especially many of the city's more than 5,000 co-op buildings—are arguably in an even more difficult position. Few co-ops have significant cash reserves, and passing on the costs of upgrades via added assessments may prove unsustainable for many owners. And both multifamily rental building owners and their tenants are concerned that significant new costs will translate into higher rents. NYSERDA's Multifamily Buildings Low-Carbon Pathways program, which offers incentivized energy upgrades that deliver savings, is one key mechanism for addressing these challenges. But the program has reached fewer than 4,000 buildings since 2020, with additional upgrades needed even among some buildings that have participated in the program in order to reach the post-2030 reduction targets.

Even if building owners are able to assemble the capital needed to upgrade, some experts say that costs will ultimately be borne by tenants. "I don't know how they will keep up with the curve without it going directly to consumers and tenants," says Joe Guerra of Ainsworth.

These challenges are not confined to Class B and C office buildings and multifamily residential buildings. Our research identified similar economic challenges facing a range of other major building owners—including universities and hospitals, cultural institutions, hotels, industrial buildings, and city-owned buildings.

But it is buildings that are home to lower-income tenants and owners, and very small businesses, that are particularly at risk of being left behind in the decarbonization push. "There is going to be, and already is, an inequity issue in transitioning to have more efficient buildings," says Rasheq Zarif of ReWyre, a property tech company with a significant presence in New York City. Without access to capital or an in-house sustainability staff to help identify government incentives, lower-income properties are going to have a tough time making the investments to retrofit. New financing schemes and hands-on strategic assistance are needed to make it possible for co-op or condo buildings with only "$30,000 in their bank account to do retrofits that might cost seven figures," says Pat McClellan of New York League of Conservation Voters.

The current penalty structure for buildings not meeting Local Law 97 requirements is unlikely to incentivize widespread compliance.

Several industry leaders and sustainability advocates assert that the current penalty structure for Local Law 97 compliance lacks the teeth to effectively encourage building upgrades, particularly among larger property owners for whom the costs of compliance will far exceed the penalties. The law imposes an annual financial penalty of $268 per ton of carbon dioxide equivalent emissions that exceed the 2024 limits for buildings over 25,000 square feet. Early results have been promising: the Department of Buildings reports that only 11 percent of covered buildings were not in compliance with the more lenient 2024–2029 emissions targets as of 2023. But as emissions reduction targets ramp up significantly in 2030, the cost of compliance will continue to significantly exceed current penalties.

Even factoring in energy savings and all available incentives, many building owners are likely to choose to pay the penalties, especially once more inexpensive upgrades like better insulation and lower-energy fixtures have already been implemented. Interviews with several industry leaders suggest that higher fines are needed to exert greater pressure on capital-rich buildings to enhance energy-efficiency and reduce their carbon footprint. One senior official from a prominent real estate company, who requested anonymity in order to discuss the firm's internal discussions, says, "To eliminate the fines, we'd have to invest 15 to 20 times the fine amount. So, like other owners, we'll probably pay the fine."

With such disproportionate financial implications, our research suggests that a broad range of building owners consider themselves likely to absorb the penalty as a cost of doing business, rather than embark on the major retrofits necessary to meet the more stringent post-2030 emissions reduction targets. The financial disincentives to upgrade may be especially significant for the owners of less well-resourced properties in lower-income communities, where the costs of upgrades

are similar to those elsewhere in the city, but the payback period for those investments will be significantly longer. At the same time, some larger property owners say that they will be reluctant to borrow at high interest rates to finance major retrofits when they will otherwise have sufficient cash reserves to pay the penalties without borrowing money.

As an alternative to paying the penalties, building owners who have not opted for the decarbonization pathway will be able to purchase renewable energy credits (RECs) and can be applied as a deduction from a building's emissions. The capital raised from RECs will go directly to transmission projects upstate, and while this can play an important role in building out renewable energy and greening the state's grid—both of which are essential to LL97's success—RECs, in addition to penalties, may be more economically attractive than retrofits.

To effectively spur action and align incentives with sustainability goals, policymakers will have to reassess penalties and RECs, while ensuring that city, state, and utility incentive programs are structured in ways that make compliance, rather than penalization, a financially viable option.

"The problem is more than the initial payback, as actual energy savings may be small," says Joe Guerra of Ainsworth. "We have done budgets that are north of $8 to $10 million [for retrofit projects]. Compare that to the small energy savings and say a penalty of $180,000 a year that is projected right now in a sample building. That's a lot of years to see a payback."

While other building owners admit that not only will they opt to eat the penalty, but they will also pass it on to tenants. "Our leases are being written differently. There's a new clause in it that when the [LL97] fine comes, we can basically say, we're sorry you got this fine," says a vice president from a real estate group with a portfolio of 60 Class B buildings across the city.

A shortage of electricians and HVAC technicians threatens to limit the number of buildings retrofits, and slow solar installation projects.

Although New York City still has a long way to go toward realizing the job creation promise of the green economy, there are already signs that demand for key skilled workers is exceeding supply—with potential consequences for the pace of electrification across sectors. Industry leaders say that a shortage of electricians and HVAC technicians proficient in advanced technologies like heat pumps poses a significant barrier to growth. "Of the more than 40,000 job listings in New York City's construction industry posted since 2020, 6,500 were for HVAC technicians while nearly 6,000 were for electrical contractors and installers, together accounting for around one-third of all jobs posted by the industry.[9]

The shortage of skilled HVAC technicians and electricians represents one of the "biggest factors and challenges in the building push [to electrify]," says Ben Rosenzweig, vice president at CoolSys and general manager of CoolSys Energy Design, a building systems engineering consultancy with a focus on decarbonization. But even as demand for these roles grows amid efforts to electrify buildings and adopt new equipment, the pool of available skilled workers is not growing fast enough. As of 2023, New York City was home to 25,121 HVAC installers and electricians—and 28,348 jobs in these occupations. With 23 percent of this workforce currently ages 55-plus, this undersupply of talent is poised to grow. To address this, policymakers will have to do more to develop a robust pipeline of skilled talent capable of tackling these new tasks and technologies.

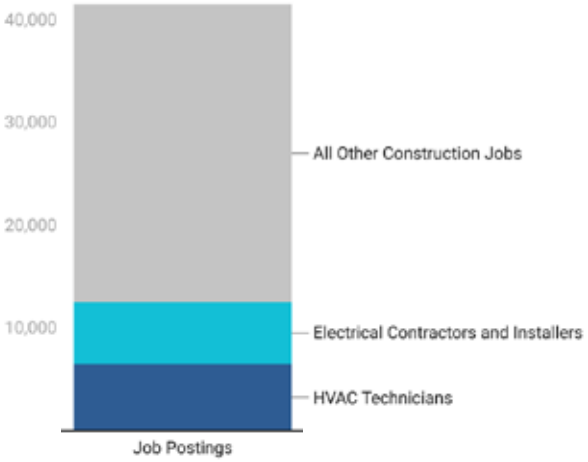
Moreover, the shortage of electricians is having a negative impact on the burgeoning solar industry, where the demand for electrical skills has never been greater, according to multiple interviews with industry experts. Bill Grinstead of Orenda and others interviewed highlighted the repercussions of this shortage, noting its detrimental effect on the sector's growth and the long-term affordability of solar projects, particularly for low- to middle-income customers. For solar to thrive and remain accessible to all New Yorkers, there's an urgent need to bolster the workforce, ensuring that the city's solar market can fulfill its job-creating potential and reach communities across the entire city.

Not enough property owners are accessing the technical assistance that exists to support building retrofits.

While thousands of buildings have taken initial steps toward implementing decarbonization projects, many property owners find themselves at an impasse, grappling with a complex landscape of programs, incentives, regulations, vendors, and emissions-reduction strategies. At the same time, our research suggests

Construction Job Postings Show High Demand for HVAC Technicians and Electrical Contractors and Installers

HVAC technicians and electrical contractors and installers represent more than one-third of construction job postings



From March 2020 to August 2024
Source: Center for an Urban Future analysis of data from Lightcast. Created with Datawrapper

that a large segment of the building sector remains largely unaware of existing programs that can help.

Various financing sources and incentives—including the city-facilitated PACE Financing program that can be used for building decarbonization projects, the recently passed J-51 tax abatement, a tax credit for residential buildings implementing retrofit projects, and the federal Inflation Reduction Act (IRA) funding for buildings working to reach LL97 compliance—can all help offset some costs of major retrofit projects or spread the costs out over time. But industry leaders and sustainability advocates report that there is little to no awareness of these programs among many of the city's smaller commercial and residential building owners—particularly those without in-house sustainability and finance teams.

With LL97 already in effect, many building owners will have to play catch up in understanding the impacts of LL97 and the available incentives to them. "To tell you the truth, most building owners are late at it already. It's something they should have started working toward back when the law was passed in 2019," says Jimmy Carchietta of The Cotocon Group, a building energy and sustainability consulting firm that specializes in LL97 compliance.

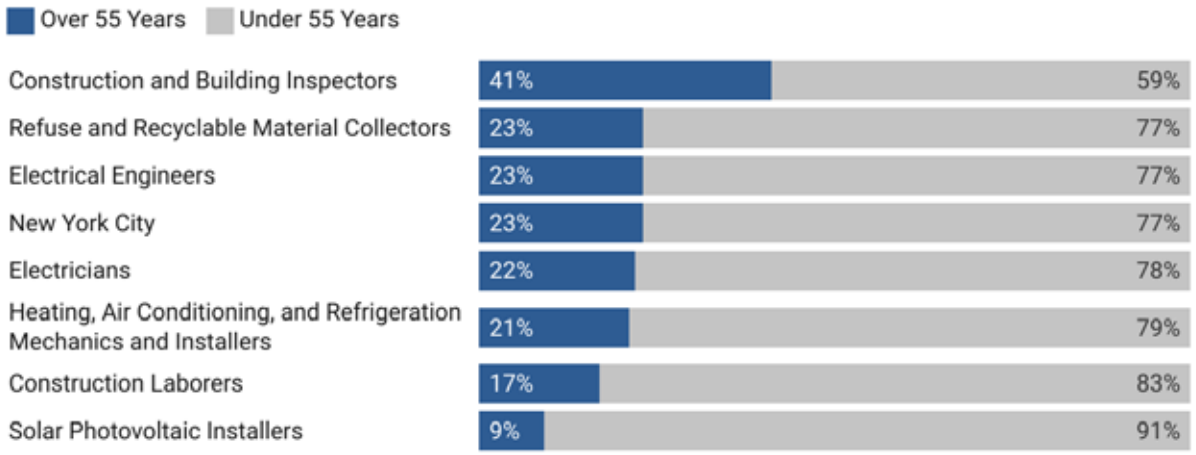
To help address this knowledge gap, the city launched an important program in 2021, NYC Accelerator, designed to help more building owners understand the impact of LL97 and options for achieving decarbonization. As an initial touchpoint, the program is making great progress connecting with affected building owners. The Mayor's Office of Climate & Environmental Justice, which manages the Accelerator, reports that 27,919 buildings have connected with the program over the past three years. But to reach more of the approximately 60,000 buildings that will be affected by the law now that it is in effect, more staff resources and outreach will be needed, including new and expanded partnerships with trusted community-based organizations that can help connect local property owners to NYC Accelerator and provide assistance in multiple languages.

In addition to ensuring that NYC Accelerator is able to support more buildings, experts say that a much higher level of technical assistance will be needed going forward. As designed, NYC Accelerator is an intermediary between building owners and contracts, functioning as a referral system. But achieving the city's building decarbonization goals will almost certainly require strengthened and expanded technical assistance that can help building owners with everything from accessing important incentives and drawing up retrofit plans.

Experts praised NYC Accelerator as a key link between building owners and vendors who can assist with decarbonization projects. However, when it comes to helping less well-resourced buildings navigate the complexities of multiyear decarbonization planning, design, financing, and execution, experts say that more support is needed. One leader of a nonprofit focused on building sustainability, who requested anonymity in order to speak candidly about a program that they work with regularly, says that NYC Accelerator is "ineffective" at meeting those more in-depth needs, at least as the program is currently designed and resourced. "As an owner, you think you will get a free audit, install, or free services," he says. "That's not what [NYC Accelerator does] … they are an advisory hand-hold to connect to a contractor."

Retirement Risk Seen Among Some Green Jobs

Some green jobs have a high share of workers over 55 years of age.



Source: Center for an Urban Future analysis of data from Lightcast. Created with Datawrapper

With LL97's implementation phase underway, policymakers must intensify efforts to assist all buildings, particularly small and financially constrained properties, in funding projects to achieve LL97 compliance. In addition to expanding marketing partnerships to increase the reach of NYC Accelerator, the city should consider additional investments to bolster and strengthen its technical assistance offerings. This entails funding a range of entities, including nonprofit organizations, trade organizations, and community-based groups, forming a comprehensive on-the-ground technical assistance corps.

The state's limited transmission capacity will make it difficult to electrify thousands of buildings and support a broad-based shift to electric vehicles.

Achieving the goals set out in LL97 hinges on the electrification of tens of thousands of buildings and hundreds of thousands of vehicles, which will draw power from the state's electrical grid to run heating, cooling, hot water, and charging systems. But the electricity supply in New York City is still heavily reliant on the combustion of gas and oil. As of 2023, about 50 percent of the city's electricity is generated by in-city power plants, and 96 percent of the local grid is powered by fossil fuels.[10]

Changing this will require a major increase in the amount of renewable electricity generated upstate that can flow into the city's grid, and growth in the transmission capacity from upstate and Long Island into the five boroughs. The New York Independent System Operator (NYISO), the not-for-profit corporation responsible for the state's energy grid, concludes that "unprecedented levels of investment in generation will be necessary to reliably deliver sufficient energy to meet future demand."

The system's overall capacity will need to triple by 2040 to meet demand projections, with at least one-third of that capacity from non-emitting sources.[11] Completing several current projects on time will be vital to this effort, such as the $6 billion Champlain Hudson Power Express that will deliver hydro power from Canada; Clean Path NY, which will bring solar, wind, and hydropower from Delaware County; and Propel NY Energy, which would enable offshore wind power generated on Long Island to enter the city's grid. At the same time, the state is seeking to boost capacity to bring offshore wind energy directly into New York City through the Public Policy Transmission Need process, in which NYISO is seeking solutions for bringing at least 4,770 MW of offshore wind generation capacity into clean energy hubs across all five boroughs.

Within New York City, as energy usage rises as a result of wide-scale building electrification and the

addition of hundreds of thousands of electric vehicles to the city's streets, electricity demands will change drastically, applying additional pressure on a grid that is already constrained in certain areas. According to a 2021 report from the Urban Green Council, in areas like the eastern Bronx, southeastern Queens, and southern Brooklyn, power demand could exceed capacity once wide-spread electrification takes off.[12] Moreover, as building heating systems transition to electrification, the city's peak electricity demand is set to undergo a significant shift. Traditionally concentrated in the summer months when buildings heavily utilize air conditioning, peak demand will now include a winter season as well.

"These peaks are the most expensive and dirty because they cause us to rely on peaker plants," says Audrey Schulman of HEETlabs, referring to the city's aging oil- and gas-fired power plants that only activate at times of peak demand. At the same time, the lack of sufficient transmission infrastructure presents a formidable obstacle to the city's full transition to electric vehicles.

Without further investment in state-wide transmission, more support for connecting renewable energy sources to the grid, technical and financial assistance for project developers, and upgrades to the city's grid to account for higher overall peak usage, there is a risk that electricity demand will exceed capacity as more of the city's economy electrifies, slowing the growth of the green economy and impeding progress toward the city's sustainability goals.

Renewable energy needs to be connected more swiftly to the city's electric grid to meet growing demand.

Realizing the emissions-reduction and job-creating potential of the green energy transition in New York City will also require policymakers to make sure that wind, solar, and other alternative energy sources increasingly being installed in the New York metro area can quickly and seamlessly connect to the city's grid.

The problem is that many of New York City's renewable energy developers are reporting long wait times for interconnection—the process by which a new power source is connected to the grid. Annika Colston, the founder and CEO of AC Power, a solar developer, notes that due to this backlog, some of the firm's current projects may not be completed until 2027.

The city needs to get "more involved and influence local utilities to allocate adequate resources for responding to interconnection requests," says one executive at a clean energy company. These delays are only exacerbated by employee shortages within city agencies that play a crucial role in siting and permitting. For instance, staff vacancies reached concerningly high levels in recent years within the Department of Buildings (22.7 percent) and the Department of City Planning (20.7 percent), according to a 2023 report from the city's comptroller's office. While in offshore wind, transmission project requests through the Department of Public Service (DPS) connecting planned offshore wind sites to the mainland will take years to permit under current regulations, causing obstacles for an industry still trying to get on its feet. At the federal level, current permitting times via the Bureau of Ocean Energy Management, the federal agency tasked with oversight of offshore wind projects, take around five to seven years to complete.

The city lacks affordable and accessible space for electric vehicle charging development

New York is beginning to experience broader popular adoption of personal EVs (from just 4,000 in 2016 to more than 27,000 today).[13] Perhaps even more significantly, the electrification of fleets in the private sector—from e-commerce and delivery companies like Amazon with its thousands of delivery trucks in NYC; to the city's 10,000 school buses;[14] and the 78,000 ride-share vehicles through companies Uber and Lyft[15]— will add well over 100,000 more EVs to the city's roads. But reaching the city's carbon neutrality goals will require around 400,000 vehicle owners to shift from gas- and diesel-powered to electric by 2030, according to the Mayor's Office of Climate and Environmental Justice. But achieving this shift—and the job creation potential that can accompany it—will require sustained investment and policy changes to dramatically expand EV charging infrastructure. The current number of public charging stations, while increasing, remains insufficient, with only 800 public stations across the five boroughs, primarily concentrated in Manhattan and parts of Brooklyn and Queens. To address this shortage, the city has announced encouraging plans to add 80 fast-charging stations on city-owned land by 2025, and nearly 10,000 curbside chargers by 2030. NYCEDC's selection of Wildflower, an urban infrastructure developer, to build the city's largest publicly accessible electric

vehicle charging site near JFK marks a key step forward, with the promise to develop an initial 65 stations over the coming year.

But realizing that larger goal will require a major push in the months ahead. Today, the city lags behind several other urban centers in the number of charging stations or the pace of new station installation. The number of public charging stations in the Houston Metro Area (which also includes the surrounding suburbs) rose more than 30 percent from 2023 to 2024, with more than 2,220 currently available. The Los Angeles Metro Area is now home to 6,728 public charging stations.[16]

To date, restrictive zoning regulations and the lack of authorized space on public property for installing new charging equipment has hindered EV charging providers' efforts to expand across the city. Anthony Willingham, the public policy manager for Electrify America, a leading national network of EV charging stations, says that companies are ready to invest in building the infrastructure but are restricted from doing so due to a shortage of publicly accessible space. "We just want [access to] the land," says Willingham. "We just want the permission to build a charger somewhere."

Despite the growing popularity of personal EVs in the city, it is the electrification of fleets in the private sector that is poised to significantly increase EV numbers on the roads while reducing emissions, driving up demand for charging infrastructure. But without sufficient space for charging station installations, achieving the city's e-mobility goals becomes increasingly challenging. "It's a chicken and egg situation," says Corey Muirhead, executive vice president of Logan Bus Company, which operates a fleet of 2,400 buses across the five boroughs. "Without charging stations, you have a vehicle that you can't charge."

After years of slow progress, momentum picked up significantly in 2024 to address these challenges. Gravity, the New York start-up backed by Google Ventures, is moving to bring its rapid charging "trees" to the curbside. Known as DEAP Trees, these can provide up to 200 miles of charge in as little as 5 to 13 minutes—significantly faster than current level 2 charging technology—although they will still require sufficient grid access to distribute the necessary 200 to 500kW of power. Brooklyn-based start-up itselectric is aiming to circumvent the grid access challenge and certain cost constraints by installing chargers using spare electrical supply from adjacent buildings, and then sharing the revenue with building owners. And Local Law 55 now requires new parking facilities to include charging stations, although more will be needed to incentivize existing parking facility owners to electrify.

Even more action is needed to dismantle barriers to charger siting and grid access across the city. Recent zoning changes passed in the City of Yes for Carbon Neutrality package are a step toward easing these restrictions, as is a July 2024 proposed rule by the New York City Department of Transportation to expedite approvals for property owners to install chargers on public sidewalks. However, further measures will be needed to realize the job creation and environmental benefits of a rapid transition to cleaner transportation options. The city should consider mandating and incentivizing charging equipment installation in parking lots and exploring innovative options like building chargers into existing lampposts or launching larger challenge-based procurements for citywide charging infrastructure.

Current infrastructure for electric micromobility is growing, but still inadequate.

Despite the rising popularity of electric micromobility options such as scooters and e-bikes, New York City's public infrastructure has failed to keep pace, resulting in inadequate storage facilities, insufficient e-mobility lanes, and a lack of designated parking and loading spaces. Cities in Europe, Asia, and beyond have developed comprehensive regulations for citywide e-scooter networks, while New York is still in the pilot phase for e-scooter programs. Paris is home to dozens of public, curbside secure bike parking stations, including many with built-in charging capabilities. By comparison, New York City has just a handful of secure public bike parking stations. And even as Citi Bike ridership continues to grow, it has only expanded to half of the city over the past decade of operation.

"New York has spent billions of dollars on transit facilities over the past 15 years, [but virtually] no micro-mobility facilities, even though they're relatively cheap," says Shabazz Stuart, CEO of Oonee, a developer specializing in bike storage and e-bike charging stations.

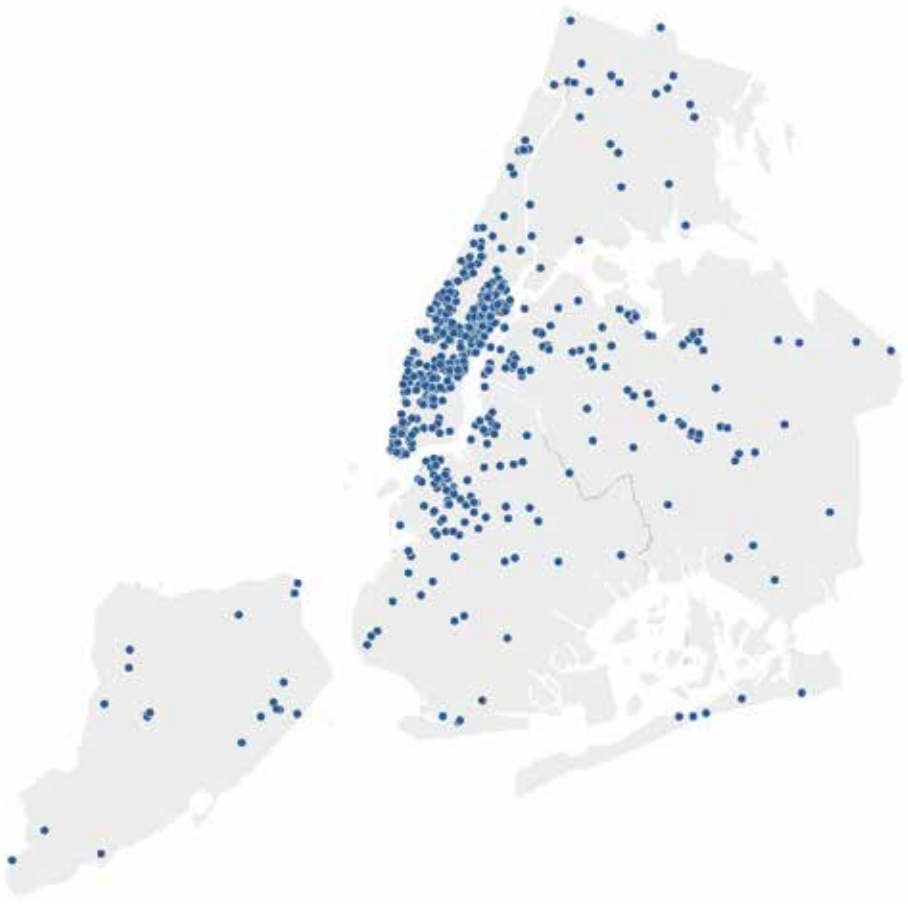
Additionally, the proliferation of e-bikes and e-scooters on city streets poses safety and logistical

challenges. The city has fallen behind in its goals around bike lane creation, even as many transit corridors experience intensifying competition for space between slower cyclists, faster electric bikes and scooters, and larger vehicles. In addition, an alarming increase in fires caused by e-bike batteries underscores the need for proactive measures to address safety concerns. Since 2019, 666 fires have occurred as a result of lithium-ion batteries (the kind commonly found in e-bikes).[17] And in the first month of 2024, there were a total of nine fires caused by e-bikes across the city.

Although some key areas of opportunity remain slow to scale up, such as dedicated bike lanes, the city has taken important new steps to keep pace with some of these challenges. For instance, the Department of Transportation's DOT Studio has partnered with start-ups via the Brooklyn Navy Yard's New Lab to pilot the first public e-bike charging stations in Manhattan and Brooklyn—a pilot that, if successful, will need additional resources to scale up across the city. Likewise, both the mayor and City Council have taken steps to curb issues with e-bike battery fires by creating battery swapping pilot initiatives in a handful of locations across the city. Going forward, the city will have to allocate resources to take these pilots to scale, dramatically expand efforts to build dedicated bike lanes and electric micromobility highways, and expand access to public charging, while doing more to educated riders, drivers, and pedestrians. By investing in infrastructure development and addressing safety issues, the city can support the

Electric Vehicle Public Charging Stations Are More Concentrated in Manhattan and Brooklyn

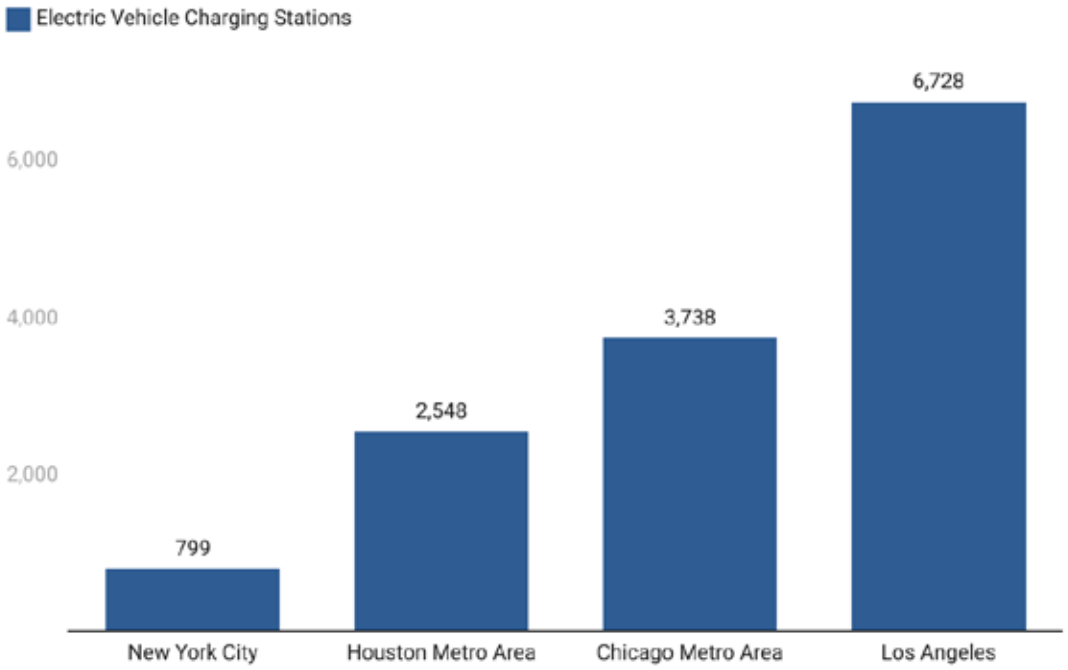
There are around 800 public charging stations across the five boroughs.



Last updated November 2024.

Source: Center for an Urban Future analysis of data from the NYC Department of Buildings. Created with Datawrapper

New York City Electric Vehicle Charging Infrastructure Lags Behind Other Major US Cities



Source: Center for an Urban Future analysis of data from the U.S. Department of Energy's Alternative Fuels Data Center and Plugshare.com. Created with Datawrapper

growth of electric micromobility for both consumers and commercial fleets, paving the way for a more sustainable and efficient transportation landscape.

The cost of EVs is still too high to incentivize broader adoption.

As New York City moves forward with mandates requiring electrification of vehicles, particularly for ride-share and bus fleets, many are encountering significant challenges in adapting to this transition. While personal electric vehicle adoption has been on the rise in the city, the electrification of private sector fleets, such as those used by e-commerce giants and ride-share companies, will introduce over 100,000 more EVs onto city roads, driving new demands in the workforce. City government has taken a proactive stance, aiming to electrify 2,000 vehicles in its own fleet by 2025 and currently operating an impressive 4,000 EVs, establishing itself as a leader in green fleet initiatives.

Despite federal tax credits offered under the Inflation Reduction Act (IRA) for EV purchases, the high cost of EVs remains a significant barrier for many. Corey Muirhead of Logan Bus Company has only been able to electrify five of his company's 2,400 buses to date, citing that electric buses are 300 percent more expensive than conventional buses. About 1 percent of all Uber rides in the city are in EVs, far below the company's 5 to 6 percent national average. Those high expenses have been offset by additional financial incentives in other states, but in New York, consumers only have access to a $2,000 state rebate, a small fraction of the cost differential between comparable gas-powered vehicles and EVs.

The city and state can do more to enable the uptake of solar across its one million buildings.

Since the solar equipment tax credit was first implemented in 2006, the growth of solar in New York City has been nothing short of remarkable. Across the five boroughs, there are now over 50,000 solar systems in the city producing over 600 megawatts, up from just 34 megawatts (MW) ten years ago.[18]

But while the pace of adoption has been swift in Queens and on Staten Island, with large numbers of single-family homes and accounting for nearly two-thirds of the city's entire solar capacity, other key parts of the city's built environment are falling behind. Large commercial and industrial buildings together account for just 7 percent of the city's total expected annual production of solar energy, with just 43 MW of solar capacity. This is in stark contrast to residential and small commercial/mixed-used buildings, which respectively have 297 MW and 281 MW of solar capacity. Meanwhile, Manhattan is among the five counties in the state with the lowest overall amount of solar capacity today, with only 20 MW of solar capacity, or just 3 percent of the city's overall capacity, in large part due to longstanding city restrictions around siting solar panels and battery storage systems that have only just begun to change. And the Bronx is also lagging behind most of the state, with only 87 MW of solar capacity, making up less than 15 percent of the city's total share. This is due to both the challenges specific to solar installation on multifamily residential buildings, as well as incentive structures that haven't been sufficient to motivate many lower-income buildings to invest in solar.

As New York strategically positions itself for a continuing solar boom, leveraging its vast 1.6 billion square feet of rooftop space, the prospects for commercial, residential, and utility solar to spark green job growth are significant.[19] But much of that progress to date has been centered on single-family homes and other small residential buildings, the low-hanging fruit for solar developers working in the city. Going forward, policymakers will need to take action to better target the buildings that have been slower to adopt solar, including larger multi-family buildings, commercial and industrial buildings, buildings home to lower-income tenants, and city owned and leased properties.

The city itself has taken some important steps to build solar on city-owned buildings, with much more opportunity for expansion in the years ahead. One important new initiative is the plan to site 30 megawatts of solar energy on NYCHA properties by 2026 through its community solar program, which also includes training initiatives for NYCHA residents.[20] Russell Wilcox, CEO of Urban Energy, a solar energy developer, says the program has fed his company a steady supply of work. In the next year alone, his company is scheduled to install solar on 30 NYCHA buildings across the city. Current legislation proposed by Council Member Sandy Nurse seeks to accelerate solar installation on city properties, mandating the installation of 100 MW of solar energy by 2025 and 150 MW by 2030.[21]

New infrastructure is needed to enable the city to grow as an offshore wind servicing hub.

New York may be well positioned to become a national leader in offshore wind, driven by a significant commitment from Governor Hochul, even in the face of Trump administration action to pause construction on new wind farms. But while there will be job creation as a result of these projects, it is far from guaranteed that these jobs will be based in the city. Without the infrastructure needed to assemble, install, and later operate and maintain this offshore equipment, the city could lose this opportunity to neighboring states, like Rhode Island and Connecticut, which have the necessary deep seaports and a more developed local ecosystem of vendors, technicians, training programs, and other service providers. In fact, New York's first offshore wind farm, South Fork, was assembled and installed from ports in Rhode Island and Connecticut.

Fortunately, city and state policymakers are taking important steps to establish crucial infrastructure for the future. The city's ongoing $191 million investment aimed at redeveloping the South Brooklyn Marine Terminal into a hub for the offshore wind industry is a crucial step, with the potential to enable offshore wind jobs to grow the five boroughs, even if the wind farms themselves are outside of the city's jurisdiction. These plans extend beyond Brooklyn, including more recent NYCEDC-launched projects intended to create offshore wind ports on Staten Island, from the Rossville Municipal Site to the Homeport Pier. Moreover, Empire State Development recently unveiled a $48 million grant earmarked for the conversion of the Arthur Kill Terminal into an offshore wind staging and assembly port. The swift execution of these initiatives will be essential to secure jobs and propel New York City into a leadership role in the emerging offshore wind industry.

Meanwhile, new investments are needed to ramp up New York's regional offshore wind supply chain. As of April, three of the state's provisional bids for offshore wind farms were scrapped due to turbine supply chain issues. To ensure the long-term success of this nascent industry, policymakers and NYSERDA

will need to do more around localizing the industry's supply chain, including awarding contracts to turbine manufacturers and investing in the infrastructure needed to support an offshore servicing industry.

"Onshore" trades will need to be re-skilled to do "offshore" work.

Interviews with industry leaders raise some concerns that New York isn't prepared for the growth of offshore wind. In addition to training future employees of wind energy companies, the state will need to do more to prepare the city's construction and building trades to be able to provide the critical onshore and offshore services these new farms will require. Unlike areas with pre-existing offshore industries that can be easily adapted, New York City lacks a robust offshore sector. The construction and building trades, integral to the success of the burgeoning offshore wind industry, will have to undergo significant retooling and reskilling to serve the emerging wind industry.

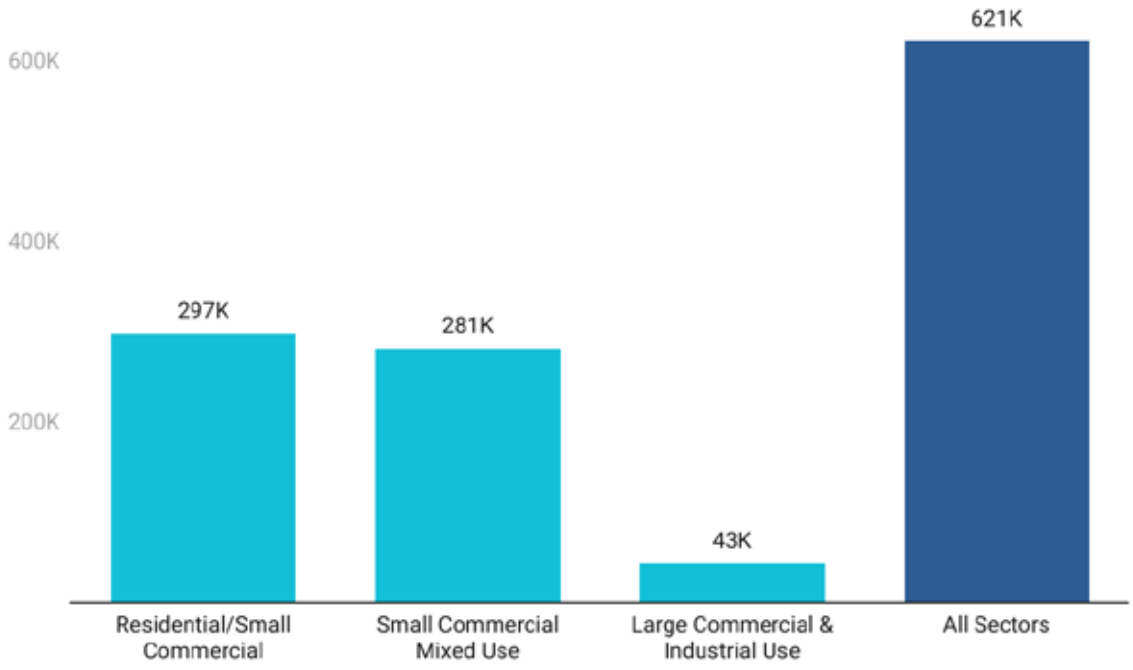
"If you look at southern Louisiana and Texas, there are entire cities that are just dedicated to offshore services," says Patrick Naylon, who manages the fledgling Brooklyn office of the global marine contracting company Heerema. "In Port Fourchon, Morgan City, and Houma, Louisiana, there are companies that specialize in providing oil drums, offshore cargo baskets, welding services, compressed gases, hydraulics, electrical supply, hundreds of companies that form this whole supply chain." But he cautions that there is little existing offshore servicing industry in New York City. NYC Talent's push to create 2,000 renewable energy apprenticeships and NYCEDC's development of offshore wind training curriculums are steps in the right direction. But realizing substantial job creation within the five boroughs will require a significant expansion of offshore-capable infrastructure, training, and business development services.

Financing offshore wind and other clean energy projects has become more challenging.

Ensuring a continuous flow of clean energy projects

New York City Solar Capacity by Sector

Total solar capacity reaches over 620,000 megawatts.



Source: Center for an Urban Future analysis of data from New York State Energy Research and Development Authority. Created with Datawrapper

is vital for growing the city's green economy and sustaining the city and state's efforts to decarbonize the grid. However, despite recent commitments by state policymakers to bolster offshore wind initiatives, including the awarding of multiple leases, challenges persist due to elevated interest rates and escalating costs of materials and services.

"We have a number of [renewable energy] projects that are lined up that have already secured contracts with NYSERDA, says Conor Bambrick, policy director at Environmental Advocates NY, a statewide nonprofit focused on combating climate change. "But now we're seeing a situation where these projects are saying they're not able to go forward." These setbacks underscore the broader financial hurdles faced by renewable energy projects statewide, which have encountered challenges securing financing. This financing conundrum is exacerbated by the gap between contracted prices for power and current market rates, jeopardizing the feasibility of some of these initiatives.

The ramifications of these financing hurdles are already being felt, with major developers like Ørsted suspending projects in neighboring states and industry giants such as BP and Equinor grappling with escalating costs for their offshore ventures in the region. And in April, three of the state's provisional bids were suspended. Going forward, policymakers will have to ensure that policies, pricing structures, and incentives align with market realities to facilitate the continued deployment of clean energy power generation projects without dramatically increasing the state's overall electricity costs.

The city lacks the space for a localized sustainable waste management sector.

As the sustainable waste management sector gains momentum in New York City, a critical challenge arises: the dearth of affordable space inhibits its growth. Businesses committed to eco-friendly waste practices like recycling, upcycling, repair, and reuse require dedicated areas for tasks like washing reusable items, storing fallen trees to be processed into commercial lumber, composting, and sorting recyclables. For these business to grow in New York City, more support will be needed to identify affordable space that can accommodate these uses.

"The compost infrastructure really doesn't exist regionally to handle what the city could be producing," says Charlie Bayrer, co-founder of Earth Matter NY, a community composting nonprofit. Devin Reitsma of Big Reuse, which manages compost drop-off sites across the city and a large-scale reuse center in Brooklyn, echoes this sentiment, highlighting the challenge of land use in New York City. In an ideal scenario, Reitsma says, "We would have been able to open several more facilities throughout New York City to keep this material hyperlocal. But with land use in New York City being the way it is, it's not really feasible."

Despite recent strides, such as the City of Yes for Carbon Neutrality's plan to ease some zoning restrictions that affect the waste management sector, this challenge persists: acquiring viable spaces for more sustainable waste management is nearly impossible under current market conditions. One promising solution is the establishment of "green waste" lots across all boroughs. Spearheaded by NYCEDC, these lots would be specifically designated for recycling, reuse, and composting vendors.

To realize more of these opportunities, the city will have to take additional steps to help subsidize the cost of real estate for sustainable waste management companies and nonprofits, ensuring longer-term affordability and scalability for budding sustainable waste initiatives.

The city lacks the mandates and incentives that would create a more robust market shift to sustainable waste management.

New York City's emerging green economy has much more room to grow when it comes to diverting waste from landfills. Today, the majority of the city's 12,000 tons of daily trash ends up in landfills or incinerated. Only 17 percent of this waste is recycled, and an even smaller fraction undergoes composting. While the city has taken important steps toward greater sustainability in the waste stream, such as mandating recycling for businesses and construction projects, banning plastic bags, and requiring some businesses to compost organic waste, there is still a lot of room for growth in the sustainable waste management sector.

Part of the challenge, according to industry experts and sustainability advocates, is that waste disposal remains significantly more financially attractive than its alternatives. Commercial waste removal remains fairly affordable when compared to cities such as Seattle or San Francisco, with businesses generating six to ten bags per year paying just $611.56

per year on average. In other areas, infrastructure to provide alternatives is lacking; for instance, the city's Parks Department alone can spend over $1.5 million on tree disposal after a major storm, even though the wood itself has significant unrealized value as lumber.

Justin Green of BigReuse emphasizes the need for increased landfill costs to discourage the ease of waste disposal: "We can get a 30-yard dumpster of whatever waste I want, picked up and thrown out for $800. That's like a whole shipping container full of garbage that just magically gets tossed for $800." To incentivize more progress around sustainable waste management, several new policies should be considered. A carbon tax on waste could help make alternatives to landfills more economically attractive. New investment in the infrastructure needed to divert more waste—like storage and milling facilities to turn fallen trees into salable lumber—could help spur additional private sector investment. NYCEDC's proposal to launch and deploy Circular Construction Guidelines to reduce construction waste is an innovative step in this direction. The city will also need to work with state legislators to develop additional incentives, or expand uses for existing credits, to help more companies absorb the upfront costs of transitioning to more circular systems for everything from building materials to takeout containers, reducing landfill waste while helping to spur the growth of the sustainable waste management sector.

Budget cuts to community composting will slow progress toward organics diversion.

The Adams administration cut all funding for the city's community composting program in November 2023, as a part of efforts to cut 5 percent of each city department's budget. The budget cuts were temporary, as funding was restored several months later in the FY 2025 budget, however the dramatic action posed a threat to the city's progress on organics diversion, and the long-term viability of the handful of organizations and vendors who are leading these efforts. The cuts meant that city-funded community composting initiatives like GrowNYC, Big Reuse, Earth Matter, and the Lower East Side Ecology Center laid off staff, operated at reduced capacity, and had to fill in with private funding to remain open. These programs, which emerged over the last few decades, grew to manage hundreds of drop-off sites and process more than 4,000 tons of food waste annually.

While the city's curbside composting program has the potential to divert a significant amount of organic waste, community composting has long played a crucial role in educating the public about composting, from instructions on how to participate to its environmental benefits. In addition, there are serious questions about the sustainability of exclusively using anaerobic digestors to process food waste, as this method produces biogas and digestor solids that later ends up in a landfill.

The budget cuts had the potential to lead to the closure of 198 out of 266 food-scrap drop-off sites, according to an analysis produced by the City Council in 2023. While the final budget ultimately restored funding, the months of uncertainty, the resources spent on budget advocacy, and the message the cuts sent, put a significant damper on this vulnerable but important part of the city's emerging green economy. To ensure the widespread adoption of composting across all five boroughs and support numerous modes of managing organic waste, city leaders should baseline funding for community composting and invest in the long-term sustainability and growth of community-scale composting programs.

Realizing the Potential of New York City's Green Jobs Training Ecosystem

Realizing the Potential of New York City's Green Jobs Training Ecosystem

7 Key Takeaways About the Programs Preparing New Yorkers for Jobs in NYC's Green Economy

With so much potential for employment growth in New York City's green economy, it is critical to take steps now and in the months ahead to make sure that a significant share of these jobs are accessible to New Yorkers of color, individuals from low-income communities, and others who have too often been shut out of other middle- and high-wage sectors of New York's economy.

The New York City Green Economy Action Plan, released in February 2024, establishes several strong commitments as part of a comprehensive talent development strategy to ensure that New Yorkers can access current and future green economy jobs. The report identified 21 "focus occupations" critical to the sustainable growth of the green economy, and a list of commitments the city is making, led by the Mayor's Office of Talent and Workforce Development, including delivering 12,000 green economy apprenticeships and launching Community Hiring Networks to support local hiring.

Going forward, policymakers will have to ensure that sufficient resources are allocated to realize the bold commitments outlined in the plan—commitments that are not yet linked to clear budget allocations. At the same time, additional policy steps should be considered to strengthen the city's existing training ecosystem, and ensure that it is able to connect New Yorkers to the parts of the emerging green economy that are most likely to add net new jobs, while enabling more New Yorkers to retrain for existing jobs that will likely demand a new level of green-enabling skills.

To help inform these vital new investments in connecting New Yorkers to the green economy, this report provides the first analysis—and map—of many of the workforce training programs that are already helping to prepare New Yorkers for green economy jobs. It includes detailed profiles of 32 nonprofit and low-cost green jobs programs focused on adults, young adults, and high school students.

To date, there has not been a publicly accessible effort to identify these programs, their scope, their strengths, and where need is not being met. In researching this landscape, we also arrived at a number of findings about this green economy skills-building ecosystem, including strengths and gaps relative to employer demand, as well as additional challenges and opportunities facing the organizations and institutions providing green workforce-training programs.

One key challenge cuts across every fact of the city's existing green economy job training ecosystem: the lack of current, granular data on job growth and skills demands in the city's emerging green economy. Data problems abound: For instance, existing federal and state labor market data does not capture or differentiate between jobs outside of the core green economy that could see green-related demand increases (like welders for offshore wind), nor does it provide insight into the nuances between an HVAC job that focuses entirely on heat pump installation, versus one that primarily services legacy oil- or gas-powered systems. Likewise, while proprietary data systems that take into account keywords in job postings can shed light on how many jobs outside the core green economy are seeking candidates with a range of green skills, it remains challenging for many workforce development and training organizations to build programs aligned with these opportunities—especially because many involve reskilling incumbent workers, rather than building entirely new pathways into entry-level employment. To inform smart public investment in the green economy training ecosystem, the city and state will have to build or procure much more comprehensive data systems and ensure access to a wide range of training and education providers.

As a consequence of these data limitations, as well as the significant work needed to ensure that the city's green economy achieves strong and sustained

job growth in the years ahead, there is a real risk that organizations could end up overtraining for certain roles, even while other areas experience supply shortages, such as HVAC technicians and electricians. Right-sizing the city's investments in workforce development programs will require a major expansion of publicly available data on real-time labor market demand for green-related occupations and skills, and a full-court press from across government to tackle the barriers to green job creation, ensuring that the New Yorkers who graduate from green economy training programs will have jobs available to them.

The following are key additional findings from our analysis of the green workforce training ecosystem:

Many of New York City's green workforce training programs successfully and quickly prepare unemployed or underemployed New Yorkers for jobs that offer a living wage and upward mobility.

Over the past decade, New York City has become home to dozens of innovative programs—often the first of their kind—that prepare unemployed people for a range of green jobs, and that teach current workers skills that they can apply in the green economy. Most programs are low cost, free or use a sliding scale tuition model, making them broadly accessible to New Yorkers from low-income backgrounds.

The majority of programs focus on training New Yorkers of color, low-income New Yorkers, those from immigrant communities, and justice-involved individuals. "If we're going to really grow the economy and keep the planet habitable, Black and brown communities actually need to be the focus of these green jobs," says Ngozi Okaro, executive director of Custom Collaborative, which trains women for careers in sustainable fashion.

Several programs boast impressive outcomes. Graduates experienced an average 20 percent increase in wages after completing the five to 12 week Building Skills NY: Construction Career Accelerator program, which provides advanced electrical, plumbing, and carpentry training for workers on today's energy-efficient buildings. Solar One's Green Workforce Program places more than 70 percent of graduates annually in new jobs installing solar energy systems. One single development project—Two Trees' Domino Sugar Refinery site—hired 115 people trained in under two months by the St. Nicks Alliance HVAC and building maintenance program.

There is no single definition of a green economy job. This report uses an inclusive definition of green workforce development programs, including those focused on building electrification and energy efficiency upgrades, renewable energy installation, resiliency upgrades, and waste management and recycling training programs for adults; courses for teens that introduce green fields from sustainable construction to regenerative urban agriculture; and climate science and natural areas management internships for young adults, among others. Programs are operated by nonprofit organizations, colleges and universities, employers, and unions, and focus on bolstering the skills needed for jobs that help decarbonize the city's built environment, increase energy efficiency, create more sustainable products and services, and boost the city's resilience to the effects of climate change.

The majority of the funding for the programs comes from public sources—a mix of city, state, and federal funds. The most common funder of the identified programs is NYSERDA, which funds, at least partially, 13 of the 32 programs. Private foundations, private companies, unions, building owners, and in a few cases, tuition fees, are also key sources of funding.

Most of New York City's green workforce training programs are small in scale.

The Center for an Urban Future identified 32 organizations offering at least 45 unique green economy training programs in New York City, but those programs serve a relatively small number of residents. Together, the programs serve a total of about 7,900 New Yorkers each year. Four programs alone account for more than half of the total slots (4,477).

Most green economy training programs are small in scale. Seventeen of the 32 organizations serve 100 or fewer New Yorkers per year. Four of the programs serve 16 or fewer New Yorkers per year.

Several programs report that they cannot meet employer demand with their current funding. The CSKILLS Pre-Apprenticeship Program, which prepares New Yorkers to enter the increasingly energy efficiency-driven building and construction trades, receives about 200 applications for its 40-seat program offered two or three times per year, leading the organization to turn away the majority of its applicants—even amid a worker shortage in the construction industry. Likewise, there is often a multi-year wait for people seeking to enroll in the Renaissance Technical

Institute's free HVAC technician and solar panel installer programs; meanwhile, unions report a shortage of workers trained to perform those jobs.

New York's green workforce training programs are more heavily concentrated in Manhattan and Brooklyn.

While significantly larger than they were even a few years ago, the city's workforce training programs for green jobs generally remain small, with limited geographic reach beyond Manhattan and Brooklyn. This is a missed opportunity given the demand for skilled workers across multiple segments of the green economy—and the need to ensure that the benefits are shared citywide.

The majority of green jobs training programs are located in Manhattan and Brooklyn. Twenty of the 32 programs interviewed for this report have Manhattan locations and 18 of the programs have Brooklyn locations. Only nine programs have locations in Queens and 12 have locations in the Bronx, the borough with the city's highest unemployment rate. Only three programs have a presence in Staten Island and no program is exclusively located in Staten Island. Two of the programs are fully virtual.

Many of the participants targeted for these programs—young people who are unemployed or people who are participating in training while working full-time—do not have the resources or time to travel to other boroughs for these programs. Only a few programs offer travel stipends.

More than half of New York City's green job workforce training programs have a focus on construction and building operations, and those programs cannot keep up with demand.

Of the 32 workforce programs we identified, 21 (or 64 percent) were concentrated in just two fields: construction and building operations and maintenance.

Construction

Eleven of these 21 programs prepare participants (more than 1,100 annually) for jobs in construction, including trades such as plumbing, carpentry, and electrical work. The construction programs' emphasis on sustainability ranges from an explicit focus to incorporating some training in or exposure to green construction jobs and methods.

For example, as a part of the 120-hour CSKILLS Pre-Apprenticeship Adult program, a building and construction trades union pre-apprenticeship program, there are six hours of offshore wind and green construction lessons. The HOPE Program's Sustainable South Bronx program blends environmental justice and energy auditing concepts with hard skills like carpentry and building mechanics. Building Skills NY Construction Career Accelerator uses the National Center for Construction Education & Research (NCCER) core curriculum, which, while not entirely sustainability focused, could eventually prepare graduates to acquire NCCER's Sustainable Construction Supervisor certification.

These programs are extremely popular. CSKILLS's youth program gets 250 to 300 applications for 120 spots, and the adult program receives about 200 applications per 40-seat cohort. Building Skills NY enrolls roughly 90 people each year in its program but has enough demand that it could easily triple that number. At Renaissance Technical Institute, a nonprofit training organization, more than 90 applicants are on its HVAC program waiting list. Pathways to Apprenticeship, the construction trades union's pre-apprenticeship program for justice-involved New Yorkers, had 297 applicants for 23 slots.

"There's huge demand" for construction workers, says Larry Rothchild, director of workforce development for St. Nicks Alliance, echoing other construction training program directors. Brooklyn developer Two Trees' Domino Sugar Refinery project has hired about 115 graduates of St. Nicks Alliance skills training programs over the past few years.

"In the construction industry, there's just such a labor shortage, skills gap, and aging workforce. On the employer side, they're just in desperate need for all levels of talent, both at the entry level, and then in the middle skill and higher skill levels," says David Meade, executive director of Building Skills NY. The organization's Construction Career Accelerator program serves 90 adults annually, and many graduates find work renovating New York City Housing Authority (NYCHA) buildings.

Building operations and maintenance

Separately, many programs—at least nine included here—are focused on building operations and maintenance. These programs encompass a wide variety of skills and jobs in commercial and residential buildings, from maintenance workers to building analysts to project managers for HVAC system installations.

All of these workers play an increasingly crucial role in helping buildings become more energy efficient and comply with Local Laws 97, 87, and 84. Building maintenance trades, for instance, can require knowledge of the building envelope, boiler systems, ventilation systems, and building inspection procedures. "There's a lot of growth opportunity in building maintenance, and a lot of our construction and developer partners have a growing need for those workers," says Rothchild of St. Nicks Alliance, which is applying for funding to create a new green maintenance training program to complement its construction training program.

"I can't swing a dead cat without hitting someone who would jump at this opportunity, in any NYCHA complex. We don't have a problem finding folks," says Lavon Chambers, founder and executive director of Pathways to Apprenticeship. "Creating partnerships with the building trades in these communities, that's what leads to more union jobs, and then that's what leads to more slots," Chambers says. Far Rockaway, Coney Island, and portions of Staten Island "need these services the most," Chambers adds.

Over the next five years, training organizations anticipate escalating need for new workers who can electrify buildings, manage building automation controls, conduct energy audits, and work in offshore wind.

Building electrification

Building electrification roles are in high demand, with Urban Green Council projecting roughly 150,000 jobs in the sector over the next several years. Even as many of New York City's green economy training programs focus on preparing people for these jobs, experts say that some are over-capacity and could be expanded. "Right now, we almost have too much work. I'm planning for next year already, which is not something I've had to do in the five plus years I've been here," says Max Levitzke, senior director of Solar One's Green Workforce programs. The programs trained 500 people in 2023 and Levitzke "expects to surpass that number in 2024," in large part due to the surging demand for renewable energy and building electrification, as owners embrace newer heating and cooling technologies and shift away from fossil fuels. "Thinking of New York City, specifically, and in most of New York State, there's been such a huge push for electrification and this transition to heat pumps. So that's our focus at this time," Levitzke says.

Building automation

Building automation control is an emerging technology field with "exceptional demand" for talent, says Michael Conway, founder & president of Stacks & Joules, which is among the only training programs citywide focused on the control side of building automation. These technology roles are necessary to help ensure that buildings optimize efficiency, drawing on building occupancy and usage patterns to control electrical, lighting, power, and climate control systems.

To meet the demand for workers, Stacks & Joules needs more funding to train instructors. "The industry itself can't find the talent it needs, so hiring that talent to do training [is difficult]," Conway says. Some of the current instructors are volunteer industry professionals, but Stacks & Joules also trains program graduates to become instructors, a process that takes about a year.

Offshore wind

Work on an offshore wind "construction hub" at Arthur Kill, off Staten Island, began in 2024, and NYCEDC projects 8,200 offshore wind industry jobs for New Yorkers by 2040.

But many of those jobs may not come for months (or years). "There's all this investment and talk around New York City about wind. We know that a lot of those jobs are going to be senior level jobs in the short term. And it's years out before the actual entry for construction-type jobs are happening," says Tonya Gayle, executive director of Green City Force. Some training providers are trying to prepare people with skills that can be applied now and be transferable later. For instance, Green City Force is training adults for construction trades that will help make them "strong candidates for a volume of wind positions," says Gayle.

The CUNY Offshore Wind Advisory Network (including Kingsborough Community College, City Tech, LaGuardia Community College, and the College of Staten Island) is awaiting funding for Bridge to Offshore Wind, an industry exposure program for adults from underserved communities. The program would funnel people into CUNY schools for training. NYCEDC recently presented a series of public information sessions about upcoming workforce development opportunities on Staten Island, including opportunities with their Offshore Wind and Waterfront Training Program, OSW NYC Waterfront Pathways Program.

Other offshore wind education and training programs are still getting off the ground. The College of Staten Island (CSI) received a $566,000 state investment in 2023 to help develop the school's curriculum around the offshore wind industry.

Energy auditors

Green City Force Service Corps prepares young adults for a variety of entry-level jobs in environmental fields, but many graduates are finding work as energy auditors, says executive director Tonya Gayle.

There is high demand for workers who can perform energy audits and some programs have found that this skillset is among the most valuable for accessing entry-level jobs in the sector. However, while a small number of programs integrate energy auditing into their curricula, there are no dedicated programs focused on getting New Yorkers trained for and directly hired into energy auditing roles. Soulful Synergy/ Willdan Clean Energy Academy provides training for work on buildings' electrical (lighting and HVAC) and thermal (building envelope, heat and hot water) systems, not energy audits, but auditing is "the catalyst for getting a lot of these projects done," says cofounder Dwayne R. Norris. "A lot of our classes are focused on energy auditing as a proficiency and skill set, because buildings need to be audited to know where the opportunities for savings are, what type of energy conservation measures should be implemented."

Electric vehicles

There is also a growing need for programs focused on training for the electric vehicle (EV) sector, including technicians who can install and maintain EV charging stations. The New York City Department of Transportation and New York Power Authority are poised to install up to 13 EV fast-charging hubs with 50 plugs, but the city will need "thousands of EV chargers by 2030." Just one program, BlocPower's Civilian Climate Corps, gives participants the option to pursue EVSE (Electric Vehicle Supply Equipment) installation/technician training. One challenge is training workers for jobs that don't yet exist. Soulful Synergy is preparing to launch an EV-charger installation training program, but is first focusing on helping city planning departments and construction companies "understand the different types of charging, and think about where EV charging should go within their buildings or parking lots, and what type of charging they need based on building occupancy or traffic," Norris says.

Funding is needed to upskill experienced, incumbent workers whose jobs are changing.

Only a handful of programs provide more in-depth training for incumbent workers who may need to acquire certifications to progress in their field, or reskilling and upskilling for workers whose jobs are changing or disappearing.

The 32BJ Training Fund, which serves the 70,000 members of the building workers union, needs more flexible funding streams to support training for incumbent workers, especially staff of historic and landmark properties that can be more challenging to sustainably upgrade, compared to new green buildings. "A lot of grants are focused on training participants for getting a new job or moving up. There are significantly less funding opportunities for incumbent workers who need training to do more or be better in their positions," says Michaela Boren, manager of green programs for 32BJ. "When people say green jobs, they automatically think renewable energy or a new title. For us, our building operators, resident managers, supers, people who run the building, those are green jobs. They are the ones with their hand on the lever that will impact how much carbon emissions the building is giving off, and making all the necessary retrofits to be more energy efficient, and conserve water, and all of that."

In 2022, DC 37, the city's largest public employee union, was granted $500,000 from the New York State Energy Research and Development Authority (NYSERDA) to expand its green jobs training program. Training will be available to union workers seeking new roles in fields ranging from energy efficiency to construction to maintenance. "This is at the core of

our future. Many of the jobs that we represented 25 years ago that are clerical and administrative in nature are now going to shift to energy efficiency titles. And we need to prepare for that shift that is happening right now," says Henry Garrido, Executive Director of DC 37. Clerical and custodial staff could be trained to review the remediation plans of buildings that are currently not in compliance with Local Law 97 (about 80 percent of buildings, according to Garrido). Additionally, custodians could be trained on boiler system emissions readers, solar energy readers, and solar battery repair, Garrido says.

Brooklyn-based nonprofit RiseBoro is planning to launch an upskilling program in sustainable building maintenance for its existing property management staff. The program, a partnership with Solar One, would begin with funding from NYSERDA. "We're constructing buildings using new types of central MEP (mechanical, electrical and plumbing engineering) design. We need the staff to be skilled, to know how to service an ERV (Energy Recovery Ventilator, an air filtration device), how often to change the filters on an ERV, and how to trouble-shoot air handler systems," says Emily Kurtz, vice president of housing at RiseBoro.

Several training programs are struggling to cover the cost of stipends, as well as provide wraparound services for participants.

Even as New York's green economy workforce programs see growing demand for their services, resource constraints are limiting their impact. Several programs expressed a need for funding to cover stipends for their participants in order to make training accessible to lower-income New Yorkers. Some also say that making programs more inclusive and effective will require funding to help support wraparound services for New Yorkers in training.

In the Youth Action YouthBuild: Building Operators Training Program, cash flow constraints caused by slow payouts of reimbursable grants have made it more difficult to pay stipends to participants. The organization also needs funding to provide wraparound services for participants in their 20s, who often need more intensive mental health services, case management, foundational training, and workplace readiness support, according to executive director Robert Taylor.

St. Nicks Alliance can only provide program stipends when funding allows, and also needs funding to cover job readiness skills, not just technical training, according to Larry Rothchild.

The RETI Center needs funding to cover internship stipends for participants in the organization's solar training program, especially those between ages 24 and 30. Many of these participants have been struggling to get back into jobs since the pandemic, according to Kaila Wilson, RETI's head of solar development. Similarly, Evelyn Ortiz, co-CEO of Opportunities for a Better Tomorrow, says that their funding from the city, which is for participants between the ages of 17 and 24 includes stipends, but that the organization has to find private sources of funding to pay for stipends for the program funded by the state, which serves participants up to age 30.

Earth Matter needs more funding to boost compensation for Zero Waste Island interns above the current $500 completion stipend. Without funding for higher pay, most interns work part-time jobs in addition to the internship—even if those jobs have nothing to do with the intern's sustainability interests—and others turn down the internship to take low-paying jobs instead. To maximize the program's impact, co-founder and executive director Marisa DeDominicis would like to offer full-time work to all interns.

32BJ cites the need for additional resources to train buildings' entire staff together, according to Michaela Boren, manager of green programs for 32BJ. Many building managers say they are unable to afford paying staff while they're being trained, while also paying for workers to cover those shifts. As a result, most of the building workers who attend courses do so on their own time. "It would be great if we could go to the building or do customized training, so they're all on the same page," says Boren. This was possible from 2008 to 2010 when 32BJ's Training Fund received a large federal grant that helped expand training for all building staff.

Initially, there were no eligibility requirements for participants in the Charles B. Rangel Infrastructure Workforce Initiative program at City College, but that affected the pace of classes. Some students needed training on using a laptop or Excel, and that left them far behind, says program manager Nury Martinez Gutierrez, "so now the requirements are going to be a high school diploma or GED." Helping more New Yorkers without the basic literacy, numeracy, or digital skills needed to succeed in training would require new investments in adult basic education and bridge programs that can provide onramps into training.

New York City's Green Jobs Training Programs

Use the QR code now
CUF has created the first-ever comprehensive map of green jobs workforce training programs in New York City.

Visit Our Interactive Map of NYC's Green Jobs Training Programs

Profiles

of NYC's Green Economy Workforce Development Programs

New York City is home to an ever-growing array of workforce development programs aligned with industries and occupations in the emerging green economy. This section of the report provides the most comprehensive snapshot to date of many of the programs that comprise the current ecosystem, with a focus on nonprofit programs aimed at serving working-age and young adults.

These profiles were developed through interviews with leaders of each program. Not all programs were able to provide all information requested.

Green Workforce Programs Profiles Index

Construction and Building Systems

Agriculture

Education

Energy

Nature Conservation

Fashion

Waste Management

1. 32BJ Training Fund: Green Buildings Courses

The 32BJ Training Fund trains members of 32BJ SEIU, the building workers union, to adopt more sustainable building maintenance practices in commercial and residential properties throughout New York City.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

Approximately 400 annually. Cohorts can range from fewer than 10 to 50.

DEMOGRAPHICS OF THE POPULATION SERVED

N/A

LOCATION OF THE PROGRAM

Manhattan: 25 West 18th Street; Queens College; NYC Technical College, Brooklyn; Monroe College, Bronx. Some courses are hybrid or online-only.

FREQUENCY/DURATION

11-week/33-hour courses and 3-to-27-hour Quick Courses available.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

32BJ SEIU membership required (70,000 members in NYC and Long Island)

APPLICATION PROCESS

Some courses have prerequisites.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

About 20-25 “green buildings” courses are available and can change from year to year, depending on industry needs and employer demand. Building owners fund the program and provide “direct input” on curriculum, says Boren. 2023 courses range from HVAC concepts to building energy grades to recycling in multifamily buildings. Graduates can earn credentials offered by Urban Green Council (GPRO), LEED, the Building Performance Institute (BPI), and U.S. Environmental Protection Agency (EPA).

"If they fulfill all the requirements, we pay for the exam, because a lot of green certifications are expensive." Michaela Boren, Manager of Green Programs

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

No direct assistance with new job placement provided, as participants are incumbent workers. A career advisor helps with resume and cover letter writing, and interviewing skills.

OUTCOMES

The Training Fund does not track outcomes.

KEY PARTNERSHIPS

New York State Energy & Research Development Authority (NYSERDA), Association of Energy Engineers, Steven Winter Associates.

Cost

Free for participants. Per-participant cost varies due to certificates tied to certain courses.

SOURCES OF FUNDING

The program is paid for by building owners. The Fund is supported by contributions negotiated between 32BJ SEIU and participating employers represented by the Realty Advisory Board. Another source is competitive grants on a project basis from NYSERDA, New York State Department of Labor, and the Workforce Development Institute.

WHAT MAKES THE PROGRAM STAND OUT?

Building workers in 32BJ SEIU will play a crucial role in the city’s ability to reduce energy usage and comply with Local Laws 92, 94, and 97. The union’s Training Fund program recognizes that many incumbent building workers will need ongoing training as the technology around emissions reductions advances and changes. “When people say green jobs, they automatically think renewable energy or a new title. For us, our building operators, resident managers, supers, people who run the building, those are green jobs. They are the ones with their hand on the lever that will impact how much carbon emissions the building is giving off, and making all the necessary retrofits to be more energy efficient, and conserve water, and all of that,” says Boren.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The Training Fund needs more flexible funding streams to support training for incumbent workers, especially staff of historical and landmark properties that can be more challenging to sustainably upgrade, compared to new green buildings. “A lot of grants are focused on training participants for getting a new job or moving up. There are significantly less funding opportunities for incumbent workers who need training to do more or be better in their positions,” Boren says.

Buildings also need grants to be able to train their entire staff together; many building managers can’t afford to pay staff while they’re being trained, while also paying for workers to cover those shifts. As a result, most of the building workers who attend courses do so on their own time. “It would be great if we could go to the building or do customized training, so they're all on the same page,” says Boren. This used to happen much more often between 2008-2010, because the Training Fund had received a large federal grant that helped raise awareness of training opportunities among building managers.

Interview: Michaela Boren, Manager of Green Programs; and James Barry, Manager of Program Development, Green Buildings.

2. BlocPower: Civilian Climate Corps

Civilian Climate Corps trains New Yorkers from neighborhoods experiencing high rates of gun violence and environmental injustice for green jobs in their own communities.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

Approximately 1,500 served annually and 60 per cohort.

DEMOGRAPHICS OF THE POPULATION SERVED

Participants are residents of neighborhoods identified as the most deeply impacted by gun violence in the city, including 93 percent Black and Brown adults, with 7 percent identifying as other. 28 percent women and 72 percent men.

LOCATION OF THE PROGRAM

Areas that experience high rates of gun violence, including in parts of the South Bronx, and in Brownsville and Central Brooklyn.

FREQUENCY/DURATION

Program is a hybrid training model, with eight weeks of classroom training and 10 weeks of on-the-job training (internship) with an employer.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

No prerequisites

APPLICATION PROCESS

Online interest form, in-person orientation, extensive intake process to assess how much extra support an applicant might need, such as mental health services.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Curriculum prepares students for entry-level careers in green building trades, including career readiness, introduction to building trades such as construction and HVAC. Participants acquire OSHA 40-Hour Safety Training, Site Safety Training, NCCER Core Construction training.

The training also offers low-voltage electrical training and basic HVAC training.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Graduates can meet with job specialists for placement in paid on-the-job training opportunities with BlocPower contractors (becoming BlocPower employees) and employer partners (in positions subsidized by BlocPower) for up to six weeks, often leading to full-time work.

OUTCOMES

More than 400 graduates have been placed in jobs during the first two years of the program.

KEY PARTNERSHIPS

Brooklyn Tabernacle Deliverance Center, Elite Learners, PowerTools, Haitian American Caucus, and Gentlemen's Factory.

Employer partners include National Grid, ConEd Academy, CB Emmanuel, SuperCool HVAC,

ChargerHelp!, Urban Energy, and Downtown Alliance.

COST

The program is free for participants. Participants are paid an hourly wage of $20 throughout the program and for on-the-job training.

SOURCES OF FUNDING

Mayor's Office of Criminal Justice which includes city funding as well as federal dollars.

WHAT MAKES THE PROGRAM STAND OUT?

Now in its third year, the program focuses on building a clean energy workforce in neighborhoods experiencing both high rates of gun violence and environmental injustice. Participants receive a broad introduction to the building trades, including construction and carpentry, low-voltage electrical systems, plumbing, HVAC systems, and building energy-efficiency auditing. Career readiness is a significant focus of the program, from resume writing and interview prep to virtual workplace etiquette, and financial and digital literacy.

Participants also receive help identifying their skills and interests, and meet with industry experts. After completing this foundational training, graduates can opt for further specialized training in various fields, such as drones or solar energy systems, depending on the needs of BlocPower partners. Other graduates begin paid on-the-job training with one of BlocPower's partner contractors or employers, in building electrification, energy systems, or EV charging stations, for instance. "They get a chance to prove themselves over an extended period of time, rather than one make-or-break interview or moment," says Pearson.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The program received a $54 million investment from the city in FY23 and is scaling up rapidly, with hopes to train between 2,000 to 3,000 New Yorkers per year through 2024. But the program will need continued investment from the city to provide effective career readiness, and to build strong relationships with employer partners to ensure high-quality job placements.

Interview with Bradford Pearson, Program Manager; and Keith Kinch, Co-Founder and General Manager

3. Building Energy Exchange (BE-Ex) Climate Ready Buildings Series

The BE-Ex Climate Ready Buildings Series educates New York City affordable housing project teams about design and construction strategies for more sustainable buildings.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

Over 80 participants had attended and in-person training session by the end of 2023.

DEMOGRAPHICS OF THE POPULATION SERVED

The series is open to the general public, but aimed at NYC Housing Preservation and Development (HPD) project teams or affordable housing project teams receiving HPD funding. A version of the training for New York State Homes and Community Renewal (HCR) project teams receiving HCR funding will be launched in 2024.

LOCATION OF THE PROGRAM

In-person training sessions are hosted at BE-Ex's learning center in Lower Manhattan. On-demand HPD and HCR training courses are available on the online learning platform BE-Ex Ed and can be accessed from any location.

FREQUENCY/DURATION

Three hours; In-person sessions are offered on a quarterly basis either in the morning (9am – 12pm) or in the afternoon (1– 4pm). The on-demand training courses can be accessed at any time.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

None

APPLICATION PROCESS

None. Participants must register to attend in-person training sessions or on the BE-Ex Ed online learning platform to take the on-demand courses.

Curriculum, including any certifications or credentials obtained

The curriculum introduces New York City and State policies impacting the building industry, as well as climate-resilient design and construction concepts. Participants can earn 3LU/HSW AIA Credits (LU = Learning Units; HSW = Health Safety and Welfare; AIA = American Institute of Architects)

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

N/A

OUTCOMES

N/A

KEY PARTNERSHIPS

NYSERDA, Mayor's Office of Climate and Environmental Justice (MOCEJ), Steven Winter Associates, NYC Housing Preservation and Development (HPD), and NYC Homes and Community Renewal (HCR)

COST

Free for participants

SOURCES OF FUNDING

MOSTLY NYSERDA

WHAT MAKES THE PROGRAM STAND OUT?

The Climate Ready Buildings Series was created by BE-Ex, the Mayor's Office of Climate and Environmental Justice, and Steven Winter Associates, a sustainable buildings consultancy that also provides training for building industry professionals. The program highlights why the building industry is adopting new design and construction strategies, unpacking the climate crisis and New York City and State legislation, including more stringent energy codes.

Participants learn strategies for lowering carbon emissions and improving climate resiliency across building systems, from sealing air leaks in the building envelope to installing electric heat pumps and cooling systems. They also learn strategies to enhance building performance and sustainability, such as the Integrative Design Process, an approach that encourages engineers to design buildings in collaboration with construction teams. The program meets certain training requirements for affordable housing development projects receiving funding from NYC Housing Preservation and Development.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

Collaborating with HPD and Steven Winter Associates encourages more decision makers in the building sector to implement sustainable design and construction strategies that can lead to higher-performing buildings. To expand its impact on the city's building sector, including from a workforce development perspective, the Building Energy Exchange needs more of these kinds of partnerships, such as with unions, trade communities, and companies within certain trades.

Interview with Katie Schwamb, Director, Educational Resources

4. Building Skills NY: Construction Career Accelerator

Construction Career Accelerator connects underemployed and unemployed New Yorkers to construction training and job opportunities.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The program serves 75 to 100 participants annually, across four or five cohorts.

DEMOGRAPHICS OF THE POPULATION SERVED

The program serves underemployed and unemployed New Yorkers who need help entering or reentering the construction sector. The majority are Black, Hispanic, Asian, or multi-racial.

LOCATION OF THE PROGRAM

LaGuardia Community College, Bronx Community College, Commonpoint Queens, Renaissance Technical Institute, City Tech (starting this fall), Cypress Hills East New York Community Center, Positive Workforce.

FREQUENCY/DURATION

Frequency and duration vary from 5-6 weeks for basic credentials and NCCER Core training, to 8-12 weeks for credential training, NCCER Core training, and NCCER Level 1 training in a specific trade.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Candidates must be New York City residents ages 18 and older, and eligible to work in the U.S.

APPLICATION PROCESS

Applicants meeting eligibility criteria undergo a rigorous pre-screening process to make sure they can commit to and be successful in the program. Construction site experience is not required, but is advantageous. A network of non-profit partners, such as BronxWorks and Commonpoint Queens, help to refer job-ready candidates for training. Candidates are screened for math skills.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The training program uses the NCCR Core: Introduction to Basic Construction Skills curriculum, a nationally recognized curriculum that prepares participants for entry-level roles on project sites. Participants may then progress to one of four tracks — carpentry, electrical, HVAC, or plumbing — for technical skills training.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Building Skills helps graduates find job opportunities immediately after completing the program, as well as when a construction project ends and they need help finding another position. Building Skills often places graduates on jobs with their employer partners, including NYCHA, primarily on new construction or renovation projects. Other graduates are already working and get a raise at their current job after completing the program.

OUTCOMES

In 2022, 91 percent of enrolled participants completed the program, and graduates experienced an average increase in wages of 20 percent.

KEY PARTNERSHIPS

Bronx Community College, LaGuardia Community College, Commonpoint Queens, STRIVE, Bronx Works, Renaissance Technical Institute. They also have a relationship with SBS Workforce 1 Career Centers.

COST

The per-participant cost of delivering the program ranges from $2,500 and up. Among 74 graduates in 2022, 30 received a $20 per hour stipend, tools, and personal protective equipment (PPE).

SOURCES OF FUNDING

ROBIN HOOD FOUNDATION, NYSERDA, NEW YORK STATE DEPARTMENT OF LABOR, TD BANK, HECKSCHER FOUNDATION, METS FOUNDATION, PINKERTON FOUNDATION.

WHAT MAKES THE PROGRAM STAND OUT?

Building Skills NY became a training provider in 2022, but had also been (and continues to be) an intermediary between training organizations, workforce development providers, and employers. The non-profit organization's board includes members of the Real Estate Board of New York (REBNY) and affordable housing developers. "The advantage of that is we were able to develop a model that had direct connection to folks that are building all over the city," says Meade. Currently, Building Skills has a network of contractors and construction employers that help inform the training program, including credentials and skills participants earn, and often provide job placement opportunities. The program is offered in the evening, so participants can keep their current jobs while training. Most participants are seeking entry-level roles, and some have held "active warehouse jobs or something off the books that's highly transferable to getting a position with one of our employers," says Meade.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

Meade says the program "could easily triple" in size, given their long wait list. The organization has a small staff of seven or eight people, and needs more funding to be able to expand, as well as improve coordination with additional community colleges and nonprofits to run its training program.

And while they have "a handful of great employer" partners for job placements, they would like to be able to grow that number by raising awareness of the program and its curriculum. "We need to get the word out more about this particular curriculum, so employers understand [workers are] coming in with this level of skill," Meade says.

Interviewed David Meade, Executive Director

5. City College Charles B. Rangel Infrastructure Workforce Initiative: Infrastructure Job Training

The Infrastructure Job Training program prepares adults without college experience for internships and specialized training in infrastructure areas and brownfields remediation.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

60 to 120 annually. 20 to 35 per cohort.

DEMOGRAPHICS OF THE POPULATION SERVED

Aimed at adults from disadvantaged communities (most participants come from Harlem, the Bronx, and Brooklyn) without college degrees or college experience. In some cases, City College students also join. 28 percent of participants in 2023 were long term unemployed.

LOCATION OF THE PROGRAM

City College of New York, Harlem Campus

FREQUENCY/DURATION

Phase 1 (Baseline): 40 hours over 1 week, Monday - Friday, 9:00am to 5:00pm

Phase 2 (catalyst): optional further training (30-hour OSHA, 10-hour SST, 40-hour HAZWOPER (Hazardous Waste Operations and Emergency Response), 12-hour GPRO, etc). If someone decides to complete Phase 1 and Phase 2, it takes around 6 weeks to complete all trainings offered. The program is offered each season (Winter, Spring, Summer, Fall).

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be ages 18 and older and have a high school diploma or GED. Individual exceptions can be made for participants in the process of getting their GED.

APPLICATION PROCESS

Prospective participants are required to complete the online registration form, followed by an onboarding session and completing the Test for Basic Adult Education (TABE) at CCNY.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Our curriculum includes an introduction to infrastructure areas (built environment, transportation, food, water, energy), digital tools like excel and GIS, as well as career development. Optional specialized training and credentials such as OSHA 30, SST 10, GPRO, HAZWOPER, and Drone Pilot License Preparation Course are also available.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

The program directors have been trying to build partnerships with relevant agencies, such as the New York City Department of Environmental Protection and the U.S. Environmental Protection Agency, and private engineering firms to help place students in infrastructure-related jobs.

OUTCOMES

Out of nine 2022 interns, six took HAZWOPER training and four passed the exam.

KEY PARTNERSHIPS

City College of New York, SoBro, Harlem Congregations for Community Improvement, Administration of Children's Services, WeAct, DOL, New York City Department of Transportation, New York City Department of Environmental Protection, Living Redemption, and Silicon Harlem.

COST

Free for participants, but no stipend is provided.

SOURCES OF FUNDING

The program received funding from the Bipartisan Infrastructure Bill, via Harlem Representative Adriano Espaillat. Additional funding is provided by City College and various awarded grants.

WHAT MAKES THE PROGRAM STAND OUT?

The CUNY Charles B. Rangel Infrastructure Workforce training program aims to give students a well-rounded understanding of different areas of infrastructure, and prepare them for internships or specialized training. Phase one ("Baseline Training") introduces five infrastructure areas — transportation, the built environment, energy, water, and food – and discusses how these areas are impacted by climate change mitigation and adaptation. This two-week phase includes training in Excel, GIS, and drones, which are used across infrastructure fields. Students also receive career readiness training and mentoring. City College professors and industry professionals deliver lessons, encouraging students to consider a wide range of infrastructure career paths. The Metropolitan Transportation Authority (MTA) chief of environmental management, the head of a construction company, the City's Energy Management staff, and a Food Bank for NYC warehouse leader have led different trainings. Graduates can progress to one week or longer of "Catalyst Training," which may include internships or specialized training in high-demand areas, such as brownfield remediation.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The program received a two-year grant and has one year remaining. They are in the process of applying for funding to continue the program.

Interview with Nury M. Gutierrez, Program Manager, The City College of New York

6. CSKILLS Pre-Apprenticeship Program

CSkills Pre-Apprenticeship Program prepares New York City public high school seniors and adults for registered apprenticeship programs in construction.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

Approximately 120 youth and 80 to 120 adults served annually.

DEMOGRAPHICS OF THE POPULATION SERVED

The program provides direct entry to Building and Construction Trades Council apprenticeship programs, as part of the Council's diversity and inclusion efforts. Youth are high school seniors, mainly from New York City Career and Technical Education (CTE) schools.

LOCATION OF THE PROGRAM

The Youth program takes place across 24 CTE high schools, as well as non-profit organizations throughout the city.

FREQUENCY/DURATION

The Youth program is offered once annually and includes 30 hours of classroom training during the spring semester (students are dismissed at half-day to attend) and 105 hours of hands-on training during the summer (full-time for three weeks). The 120-hour Adult program is offered two or three times annually and includes two weeks of full-time classroom training and three weeks of full-time hands-on training.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Youth program participants must be a senior in a New York City public high school, and have a 70 percent cumulative GPA and 90 percent attendance record. Adult program participants must live in New York City, have a high school diploma or equivalency, and be legally eligible to work in the U.S. All participants must be able to perform physical work.

APPLICATION PROCESS

Youth program participants are referred by their high school. Adult program applicants must register at a New York City Department of Small Business Services Workforce 1 Career Center, attend an information session, complete an application, pass the test of adult basic education, and do a group interview.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Youth and Adult programs use the North America's Building Trades Unions (NABTU) Multi-Craft Core Curriculum, which centers around the construction industry and trades, and incorporates green construction topics. They also earn a local certificate from Construction Skills, which is for direct entry to apprenticeship programs (a lottery system is used for general recruitment for these programs). Programs also include OSHA 30-hour Construction Safety and Health and 10-hour NYC Site Safety Training.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

CSkills has strong relationships with the registered apprenticeship programs of the Building and Construction Trades Council and helps with placements. The program provides career counseling, resume assistance, interview and exam preparation as needed (only some unions have placement exams).

OUTCOMES

Up to 20 percent of entering apprentices to registered apprenticeship programs of the Building and Construction Trades Council can come from Construction Skills.

KEY PARTNERSHIPS

Building and Construction Trades Council

Apprenticeship Readiness Collective (ARC), a collective of workforce development organizations formally endorsed by the Building and Construction Trades Council of Greater New York.

COST

Per-participant cost of delivering the program is about $8,500.

Participants in both programs receive travel stipends and a modest graduation stipend intended to help pay apprenticeship dues and entrance fees when they're placed.

SOURCES OF FUNDING

New York City Small Business Services funds the adult program.

WHAT MAKES THE PROGRAM STAND OUT?

CSkills originated in the mid-aughts to improve access to union apprenticeships for adult residents of NYCHA communities, and later shifted focus to communities most impacted by Hurricane Sandy. Today, both the Youth and Adult programs provide New Yorkers from underrepresented communities with Direct Entry to unionized apprenticeship programs of the Building and Construction Trades Council, exempting them from the general recruitment lottery system for those programs.

Both programs incorporate classroom and hands-on training, and use elements of the North America's Building Trades Union's Multi-Craft Core Curriculum (NABTU MC3). Students learn about the construction industry and different trades, tools and materials, basic math, and how to read blueprints. The Adult program includes six hours of offshore wind and green construction lessons, and Bertran says the unions themselves focus on sustainable construction. Both programs incorporate hands-on training in a simulated construction site, and at actual work sites helping renovate community-based facilities. Through the Trade Speaker Series, students are exposed to union workers, including graduates of CSKILLS.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

To reach more applicants, CSKILLS needs unions to grow. There's more than enough demand for programs: every year, the Youth program gets 250 to 300 applications for 120 spots, while the Adult program receives about 200 applications per 40-seat cohort. Bertran would like to run more cycles of the Adult program, but says "I don't have a lot more opportunity to place people."

Interview with Nicole Bertran, Executive Vice President, The Edward J. Malloy Initiative for Construction Skills

CONSTRUCTION AND BUILDING SYSTEMS

7. DC37 Green Jobs Training Initiative

The DC37 Green Jobs Training Initiative provides green upskilling for the union's incumbent engineers, architects, and construction project managers.

NUMBER OF PARTICIPANTS PER COHORT/YEAR

The program aims to run 5-6 cohorts per year. Each cohort includes around 25 participants.

DEMOGRAPHICS OF THE POPULATION SERVED

Half of the population served must belong to a NYSERDA-designated priority population or disadvantaged community.

LOCATION OF THE PROGRAM

Most of the training is virtual, but hands-on training takes place at the Bronx training lab of the Association for Energy Affordability (AEA), a DC37 training partner.

FREQUENCY/DURATION

The four to five month training program is offered at least twice per year, from May through December, and includes two or three three-hour virtual training sessions per week.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Active DC 37 members from any and all titles are eligible. NYSERDA requires that trainees are New York State residents, and 50 percent of trainees must belong to a priority population or disadvantaged community, defined as below state average income, single parent, disability recognized by ADA, previously incarcerated, ages 18-24, etc.

APPLICATION PROCESS

Interested candidates must complete a 22-question online application.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The curriculum focuses on the energy-efficiency upgrade process for residential, multi-family, and small commercial buildings. Participants are prepared for the various Building Performance Institute (BPI) certifications such as the Multifamily Building Analyst certification, the Healthy Home Evaluator certification, and the Association of Energy Engineers (AEE) Certified Energy Auditor certification. They can also earn the Urban Green Council's GPRO certifications for different trades as all as LEED certification as an entry-level green associate.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Graduates receive help with resume writing, test taking, interview techniques and other job-related assistance.

OUTCOMES

Graduates are tracked for up to 12 months from completion of training to determine if they were able to secure a higher paying position and/or qualify for a civil service exam. Participants in the first cohort earned 71 GRPO certifications from Urban Green Council, including Environmental Fundamentals, Electric, Mechanical, and Operations & Maintenance.

KEY PARTNERSHIPS

The DC 37 Education Fund (EdFund) manages training and workforce development on behalf of the union. This program is a partnership with the Association for Energy Affordability (AEA), Energy Economic Development Corporation (ENYCEDC), and Envirolution

COST

Training and certification exams are free for participants. Because there are multiple tracks a participant could take, they said that they can't provide a per-participant cost.

"Anecdotally, I would say about a quarter of our funds now have been devoted for the green renewable jobs," says Garrido.

SOURCES OF FUNDING

Initial grant funding in 2019 from NYSERDA's Energy Efficiency and Clean Technology Training Fund. Other funding from the union's Education Fund. Going forward, funding will come directly from the DC 37 Education Fund.

WHAT MAKES THE PROGRAM STAND OUT?

DC 37 is the City's largest public employee union, with about 150,000 members, including a variety of building workers, from custodians to food service workers to architects in the Department of Buildings. The union's Green Jobs Training Initiative has provided advanced-level training for higher-earning members of the union who need to earn certain licenses to retain their jobs. Most participants have been incumbent engineers, architects, construction project managers, and other technical job titles. Going forward, the program will expand to include re-skilling for lower-paid workers, such as custodians and clerical workers, many of whose jobs will disappear in the coming years, according to a 2022 NYSERDA clean energy industry analysis that Garrido cited. By expanding training to include these workers, the union hopes "to create more paths of upward mobility for those folks to become a laborer or a custodial supervisor

or an energy auditor, any of those new titles that are going to be created," Garrido says.

Courses cover a wide range of fields, such as Energy Auditing, Multifamily and Commercial Building Analyst, Carbon Accounting, LEED Green Associate, Energy Benchmarking, and Construction Management. Training begins with foundational knowledge of the energy efficiency upgrade process for residential, multi-family, and small commercial buildings. Participants receive hands-on technical training in Association of Energy Engineers heating and cooling labs to improve their knowledge of electrical and mechanical systems, and green operations and maintenance skills.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The union needs more funding to be able to expand green jobs training to additional sites across the city. "We have people in all the [city] agencies across five boroughs. It's hard to create a class of five in Staten Island, for instance, or some parts of the Bronx," says Garrido.

Interview with Henry Garrido, Executive Director

CONSTRUCTION AND BUILDING SYSTEMS

8. Helmets to Hardhats

Helmets to Hardhats (H2H) is a workforce development service that helps veterans identify career opportunities across the various building and construction trades unions in New York City.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

700 to 750 veterans served annually.

DEMOGRAPHICS OF THE POPULATION SERVED

All participants are veterans. 85 to 87 percent of population is male. Typically, the age of participants is between the ages of 21 and 40.

LOCATION OF THE PROGRAM

Service is provided online and via telephone, but the office is based at H2H headquarters in Midtown Manhattan.

FREQUENCY/DURATION

Frequency and duration of service varies case by case (person, trade selected, military discharge timing).

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be physically able to do the work they want to do and must be a veteran or currently serving in the Reserve or National Guard.

APPLICATION PROCESS

Applicants must register on the H2H website, submitting their resume and verifying their honorable discharge or current active status as a Reservist or National Guardsman.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

H2H helps participants to identify the trade they want to pursue (electricians, iron workers, plumbers, carpenters, operating engineers, and insulators). The service helps participants prepare for the requirements of the trade they choose, including the conditions of the work as well as the necessary skills. Depending on the union, participants will receive help to prepare for an aptitude test, physical test, and other union tests.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

H2H actively shares information of participants, both current and former, with various unions.

OUTCOMES

In 2023, the H2H reported 130 verified apprenticeship placements. This number is down from pre-covid levels, when placements were closer to 200+.

KEY PARTNERSHIPS

Iron Workers Local Unions, Insulator Local Unions, Boilermakers Local Unions, Electricians Local Unions, Teamsters Local Unions, Bricklayers Local Unions, Elevator Constructors Local Unions, International Union of Operating Engineers Local Unions, International Union of Painters and Allied Trades, Laborers International Unions, Operative Plasterers' & Cement Masons' International Unions, Sheet Metal Workers International Unions, Steamfitter & Plumbers Unions, Carpenters Unions, and Roofers Unions.

Apprenticeship Readiness Collective (ARC), a collective of workforce development organizations formally endorsed by the Building and Construction Trades Council of Greater New York.

New York City Department of Veteran Services.

Samaritan Village.

COST

Per-participant cost of delivering the program is around $4,200. H2H is free to all participants.

SOURCES OF FUNDING

New York City and New York State funding, grassroots fundraising.

WHAT MAKES THE PROGRAM STAND OUT?

H2H is unique in that it has a direct and strong relationship with the trade unions across New York City. Executive Director Anne Trenkle said, "if any veteran wants to [start their career in the trades], this is the program that they're going to use to get into one of the unions." As an H2H participant, veterans can gain access to union apprenticeships that can kickstart their career after their time in the military. H2H additionally has a remarkably high retention rate, as 86 percent of veterans in New York City that started their apprenticeship after help from H2H complete their apprenticeship, leading them to better job opportunities in the future.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

To maximize impact, H2H needs the number of union projects to grow. Union employment is key to a career that is sustainable and stable. H2H's Anne Trenkle poignantly said, "If [veterans] are going to a union...they have a full career. They have money put aside into the pension. They have annuities. They have full benefits for themselves and their family." In a non-union job, veterans don't get that desired job security.

Interview with Anne Trenkle, Executive Director, New York State

CONSTRUCTION AND BUILDING SYSTEMS

9. The HOPE Program

The HOPE Program is a nonprofit that offers paid training for jobs in green construction, energy efficiency system upgrading and maintenance, heat island mitigation, and horticulture.

SUSTAINABLE SOUTH BRONX

This full-time 14-week program trains adults in green construction and maintenance in the South Bronx, as well as energy efficiency upgrades throughout the borough. Participants can earn up to 10 certifications, from OSHA 10 General Industry to Asbestos Handler, and are paid $50 per week.

NYC COOL ROOFS

In this full-time 11-week transitional work program, participants are trained to apply white coating to rooftops to reduce the urban heat island effect. They must be able to carry heavy paint buckets. Participants can earn up to seven certifications, such as OSHA 30 Construction and NYC DOB 4hr Supported Scaffold User. Pay is $15 per hour.

GREEN AND CLEAN HVAC

This full-time 12-week course trains participants to manage and maintain energy-efficient heating and cooling systems across New York City. The program includes a paid 8-week hands-on internship, and a $125 weekly stipend. Five certifications are available to participants, such as OSHA 30 Construction and GPRO Mechanical.

INTERVINE

This full-time 10-week horticulture-focused program trains participants to develop and maintain green infrastructure projects, such as solar energy, green roofs, and rain gardens. Participants maintain the Fordham Road Business Improvement District and can earn eight certifications, including OSHA 30 Construction and Solar PV Installation. They are paid $15 per hour.

Data across all programs:

NUMBER OF PARTICIPANTS SERVED ANNUALLY

20-25 per cohort. 2-3 cohorts per year, per program.

DEMOGRAPHICS OF THE POPULATION SERVED

Trainees are from under-resourced communities. Some trainees are justice-involved or experiencing homelessness.

LOCATION OF THE PROGRAM

1 Smith Street, 4th Floor, Brooklyn, NY 11201

1360 Garrison Avenue, Bronx, NY 10474 and Part of the Solution (POTS), 2450 Grand Concourse, Bronx, NY 10458 (Satellite location)

FREQUENCY/DURATION

Graduates can receive lifelong support, including help with career advancement and retention or career change. Trainings run from 7 to 14 weeks and includes classroom work, hands-on learning, transitional work with paid wages, and internships.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Ages 18 and older. Legally eligible to work in the U.S.

APPLICATION PROCESS

Registration session to learn eligibility requirements, followed by application to preferred program. Pre-program digital literacy assessment. Admission Coordinators lead an intake process to determine student needs, such as transportation, food, and childcare.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

All programs incorporate the HOPEworks curriculum, including digital literacy, resume writing, and interviewing skills. Participants also receive training in wellness and mindfulness. Trainees can receive wraparound services including food, professional clothing, and mental health case management.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Participants begin working with employment specialists during programs. Mock interviews are part of most programs.

OUTCOMES

79 percent of graduates achieved employment in 2022, earning an average of $18 per hour in their first job.

KEY PARTNERSHIPS

SolarOne (for HVAC program), Part of the Solutions (POTS) (for HOPEworks program), RAIN Coalition (for Intervine program), and NYCHA REES (for recruitment).

COST

Free to participants. Stipends are provided as well as wages earned in transitional employment programs.

SOURCES OF FUNDING

In recent years, the organization has received funding from New York State, the New York City Department of Housing Preservation and Development, the Enterprise Foundation, U.S. Department of Labor, U.S. Environmental Protection Agency, NYSERDA, Robin Hood, New York Community Trust, Tiger.

WHAT MAKES THE PROGRAM STAND OUT?

The HOPE Program aims to help unemployed or underemployed adults get the training and support they need to embark on sustainable careers. The organization's curriculum combines hands-on learning with general workplace readiness, wellness offerings, and wraparound case management, from childcare to mental health services. Many trainees are from neighborhoods that have borne the brunt of climate change impacts like air pollution and extreme heat.

Addressing climate justice challenges can be empowering for students when they realize, "I'm doing something here for the environment and the people who live here,'" Chapman says.

Employment counseling is integrated throughout the program, until students find their first job, and is available to alumni throughout their careers. The program is working to deepen connections between students and employer partners, including through forums where employers present their companies and meet with students.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The organization needs more funding to continue its HVAC program.

Interview with Ana Chapman, Chief Program Officer

CONSTRUCTION AND BUILDING SYSTEMS

10. Nontraditional Employment for Women (NEW): Green Collar Prep

Green Collar Prep is a union pre-apprenticeship program led by Nontraditional Employment for Women that prepares women in underserved communities for careers in construction.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

Approximately 75 participants served annually, and up to 25 per cohort.

DEMOGRAPHICS OF THE POPULATION SERVED

Women, transgender, and non-binary individuals from underserved communities.

LOCATION OF THE PROGRAM

243 West 20th Street, Manhattan; Solar One in Long Island City

FREQUENCY/DURATION

The 7-week, full-time program is typically offered to around seven cohorts through the year.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

The program is open to women, transgender, and nonbinary individuals ages 18 and older. Participants must have a high school diploma or equivalency.

APPLICATION PROCESS

Applicants attend an information session, are interviewed, and must pass a basic Math/English test.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The curriculum focuses on green construction and provides a broad overview of building trades. Participants may obtain OSHA-30, Site Safety Training, GPRO, and graduation certifications from NEW and Solar One. NEW is recognized by New York State as a pre-apprenticeship provider, which allows individuals who have completed the training to have 'direct' entry to union apprenticeship programs.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Graduates receive support from NEW's employment team as they pursue career placement with their preferred Building and Construction Trades Council union.

OUTCOMES

More than half of graduates over the past year have been placed in apprenticeships with the electricians union, IBEW. A few have joined the carpenters union (NYC District Council of Carpenters).

KEY PARTNERSHIPS

Building and Construction Trades Council (the umbrella group for about 20-25 construction and building trade unions); Solar One

COST

The per-student cost of delivering the program ranges from $9,000-$10,000

The program is free for students. No stipend. NEW provides all transportation costs for training.

SOURCES OF FUNDING

NYSERDA is the program's largest funder. Corporations such as Con Edison and LendLease have provided grants of less than $100,000.

WHAT MAKES THE PROGRAM STAND OUT?

Nontraditional Employment for Women is one of few (the only?) organizations providing training programs for women and transgender individuals seeking careers in construction, utility, and maintenance trades. Students receive hands-on training in the use of tools and building materials through shop classes in carpentry, electrical work, HVAC, solar, plumbing, and painting. They practice lifting and carrying materials, and learn math for green trades. Graduates leave with a broad understanding of possible career paths across the green economy, and are positioned for apprenticeships in a variety of unions. "We're opening the door for apprenticeships, getting them acclimated and introducing trades, so they're informed and empowered to make career decisions further down the line," says Chan.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

As federal infrastructure dollars flow into the city, NEW wants to ensure it has "women available when those projects really ramp up." But even as interest in Green Collar Prep has been driven by younger workers who "understand the need for sustainability," union placements are still recovering to pre-pandemic levels, which makes the unpaid program less attractive. "Recruiting is a challenge. People want paying jobs, rather than investing in intensive training," says Chan.

Interview with Julie Chan, Institutional Giving Manager

CONSTRUCTION AND BUILDING SYSTEMS

11. Opportunities for a Better Tomorrow's Renewable Energy and Sustainable Construction Program

Opportunities for a Better Tomorrow (OBT)'s Renewable Energy and Sustainable Construction Program is a multi-part training program for young adults to gain a basic understanding of the construction sector and necessary certifications, along with a deep dive into renewable energy, including a significant focus on offshore wind power.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

125 people per year

DEMOGRAPHICS OF THE POPULATION SERVED

One of the Renewable Energy and Sustainable Construction Program's is called Construct Forward, which is a program funded by New York City Department of Youth & Community Development is specifically directed for youth ages 17-24. In addition, through funding from Empire State Development, the program serves another 50 people up to the age of 30. There is also a program for English language learners.

LOCATION OF THE PROGRAM

The main site of the program is in Sunset Park, Brooklyn in Industry City's Innovation Lab. Participants begin their training there and return once a week for case management and ongoing support even when they are working elsewhere. Field training locations include Kingsborough Community College in Sheepshead Bay and East New York; Greenwood Cemetery; and other union training facilities in New York City.

FREQUENCY/DURATION

Construct Forward is offered twice a year, in the fall and the spring. Specialized training in masonry and HVAC, as well as ESOL contextualized learning, are offered once a year.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Construct Forward is a program for young adults aged 17-24 who have a high school diploma or equivalency. Adults up to age 30 can participate in the program through Empire State Development funding.

The ESOL contextualized training in the construction industry requires that participants be moving toward work authorization (e.g. they have authorization or have applied for it), and that participants have at least a level 3 of English language proficiency. This program is funded by the Hispanic Federation.

APPLICATION PROCESS

A two-day process that includes in-person visits to bring in documentation and be assessed by a case manager. English language learners also need to take an English test.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The Renewable Energy and Sustainable Construction Program is an umbrella for several programs.

Construct Forward is a part of New York City Department of Youth and Community Development's Advance and Earn program. This is a sector-based advanced training module where participants gain a basic understanding of the construction sector, with an additional deep dive into renewable energy, including offshore wind power. The first five weeks offer foundational skills and readiness. Then, in partnership with Kingsborough Community College, participants gain basic hands-on construction skills and certifications (including OSHA and flagging), and are exposed to a curriculum on renewable energy, including an offshore wind training, as well as electrical training. It is an opportunity to experience a curriculum on several topics, each which might otherwise require intensive, lengthy trainings.

In addition, there are two specialized trainings that participants can undertake: a 12-week masonry program, which concludes with an internship at Greenwood Cemetery, and is focused on sustainability and preservation; and an HVAC training, which will be launched in 2025 in partnership with Soulful Synergy. The HVAC training includes a Certificate of Fitness for Citywide Fire Guard and a focus on sustainability.

There is also a separate, contextualized ESOL training for English language learners.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

After gaining occupational skills and undertaking experiential learning, participants move into employee placement. This includes partnerships with the pre-registered apprenticeship program through New York State and several unions including, DC9 (District Council 9 of the International Union of Painters and Allied Trades (IUPAT), as well as unions for carpenters, ironworkers and electricians.

OUTCOMES

Not yet, as the programs are completing their first year, and expanding next year.

Key partnerships (with employers, nonprofits, government, educational institutions, etc.)

ConEdison, DC9, Greenwood Cemetery, Haugland Group, Kingsborough Community College, National Center for Construction Education & Research, Soulful Synergy

COST

The program is free to participants. It costs an average of about $13,000 per participant for the program to run. The cost varies depending on the exact program.

Participants are paid a stipend for the initial three to five-week training and then an hourly wage (typically $21 per hour) for up to 250 hours (five to six weeks) in an internship. Metrocards are provided if needed.

SOURCES OF FUNDING

$647,000 from Empire State Development; $220,000 and $125,000 from the New York State Department of Labor; $650,000 from New York City Department of Youth and Community Development; $130,000 from the Hispanic Federation; and other funding from the Consortium for Worker Education and the World Monument Fund.

WHAT MAKES THE PROGRAM STAND OUT?

Because the program is located at Industry City, there are many partners all in one place. This allows for robust career exploration activities including with Equinor, the international energy company. We also have specific programs that cater to key target populations: young people who are out of work and new arrivals to the United States. We offer comprehensive case management services and our training partners have a deep understanding of the populations we serve and the barriers they face.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

We need dollars for infrastructure costs and general operating support. The funding from the state is entirely programmatic, which does not cover any overhead. These are programs that cannot be delivered online, and there are costs of operating in-person. In addition, we are not going to get paid a year out from now, and it is hard to acquire loans and funding because contracts are being paid significantly late for organizations across the state.

Interview with Evelyn Ortiz, Co-Chief Executive Officer, Opportunities for a Better Tomorrow (OBT)

12. Pathways to Apprenticeship

Pathways to Apprenticeship is a building trades union pre-apprenticeship program for adults from low-income and justice-involved communities.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The program serves 100-120 participants annually (20-25 per cohort).

DEMOGRAPHICS OF THE POPULATION SERVED

The program serves adults from low-income communities. More than 60 percent are re-entry justice-involved individuals. Many are NYCHA residents.

LOCATION OF THE PROGRAM

P2A doesn't have a training facility. They set up temporary training space in neighborhoods where projects are happening and then move out when the project is done. Current projects are often in Harlem and there are several in Brooklyn, but Chambers sees great need for training in Rockaway, Coney Island, and Staten Island communities.

FREQUENCY/DURATION

This is a 5-week full-time training program (8am-3pm daily).

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be a New York City resident, age 18 or older, have a high school or equivalency diploma, pass two drug tests, and be able to lift and carry 50 pounds.

APPLICATION PROCESS

Interested participants attend an information session where they fill out an application. Every applicant is interviewed and assessed for their level of motivation.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Participants receive building trades workforce readiness skills, including a basic understanding of the various construction trades, such as the role on the job site, pay scale and benefits. They tour union training facilities to learn about different building trades, do daily physical conditioning, and earn OSHA 30, Scaffold Safety, and Flagger Certifications.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

P2A helps graduates secure interviews with their desired NYC building trade union apprenticeship programs.

OUTCOMES

Since its founding in 2013, the program has placed hundreds of graduates in building trades unions, including Laborers, Ironworkers, Plumbers, Electricians, Steamfitters, Insulators, Bricklayers, and others.

KEY PARTNERSHIPS

P2A feeds candidates to about 18 different building trades apprenticeship programs.

NYC Small Business Services (SBS)

NYCHA (for recruitment and training on construction sites)

Columbia University (students work and train on Columbia's Manhattanville development project)

Exodus Transitional Community

Osborne Association

Center for Employment Opportunities (CEO)

COST

The per-participant cost of delivering the program is roughly $7,000. Training is free to participants and they receive a $300 per-week stipend.

SOURCES OF FUNDING

NYC Small Business Services (SBS) provides funding for classes. NYCHA covers stipends when projects/training are happening in NYCHA communities.

WHAT MAKES THE PROGRAM STAND OUT?

Pathways to Apprenticeship works with a population of adults from low-income communities, most of whom are justice-involved. No one is turned away for lacking experience. "If you come in with a resume, we'll read it, but we don't really care. What we're trying to determine is who is the hungriest," Chambers says. The program emphasizes soft skills to help ensure graduates' success once training ends, including financial literacy, anger management, and numerous resume and interviewing sessions.

The lead instructor graduated from the first P2A class in 2013, and the program tries to connect alumni with new graduates for mentorship during their apprenticeship. The training program incorporates basic math for construction, as well as certifications necessary to work on a New York City construction site. Every day of the program begins with an hour of physical training. Students also tour various building union training facilities to understand the various options within any given trade. For instance, there are maybe a dozen different types of painters and 15 different carpenter specialties, according to Chambers.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

P2A turns away many strong candidates for training. Chambers says that better partnerships between building trades and NYCHA communities would enable the program to expand, lead to more apprenticeship placements, and ultimately union jobs for the populations P2A works with.

They also need more funding to increase retention services, from ensuring graduates' attendance at union meetings to introducing them to alumni. They also need funding for stipends. NYCHA covers stipends, but West Harlem Development Corporation, which used to help pay for stipends, no longer does.

Additionally, P2A would like to incorporate sustainability into its curriculum. Chambers is trying to develop a partnership with the Harlem environmental justice organization WeAct to make this happen.

Lastly, they are struggling to recruit more women into the program. Many women mistakenly think they won't be able to do the work, according to Chambers.

Interview, Lavon Chambers, Co-Founder and former Executive Director

CONSTRUCTION AND BUILDING SYSTEMS

13. Renaissance Technical Institute: HVAC Technician and Solar Panel Installer Programs

Renaissance Technical Institute is a Harlem-based non-profit focused on providing free vocational education and training, including HVAC Technician and Solar Panel Installer programs, for young adults.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The HVAC program serves 70 participants per year. The Solar Panel Installer program serves about 60 participants per year.

DEMOGRAPHICS OF THE POPULATION SERVED

Mostly Black and Hispanic adults. Many do not have a high school diploma or equivalency.

LOCATION OF THE PROGRAM

East Harlem

FREQUENCY/DURATION

Level 1 training is six months long; Level 2 training is five months long. Students can get a job after completing Level 1 training, or opt to complete Level 2 training.

HVAC Technician training: 355

Solar Installer training: 225

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be age 17 or older and demonstrate a commitment to the program.

APPLICATION PROCESS

After completing an online application, participants are often placed on a waiting list. (Hiraldo says there are more than 90 applicants on the HVAC program waiting list, and about 150 on the Solar program waiting list.)

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Both programs begin with 80 hours of NCCER Core Curriculum, a nationally recognized curriculum that introduces basic construction skills. The HVAC Technician training program curriculum covers basic HVAC and safety principles, heating and cooling, and modules that introduce topics such as commercial air systems and heat pumps. The Solar Installer curriculum explains the design of different photovoltaic system components and how they work. The HVAC program can be conducted in both English and Spanish.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Hiraldo does a lot of outreach to construction companies and developers for job placement opportunities. These companies also reach out when they need workers.

OUTCOMES

Tracking outcomes is difficult because RTI has only a small staff, says Hiraldo. He'll sometimes hear from graduates when they return for Level 2 training.

KEY PARTNERSHIPS

RTI provides OSHA 40 training to students attending three high schools in the New Visions network, which includes charter, public, transfer, and ELL high schools. In 2023, RTI developed new partnerships with the New York State Department of Labor and the New York City Human Resources Administration for their HVAC program.

COST

The per-participant cost of delivering the programs is $4,500 for HVAC and $4,500 for Solar.

Programs are free to students.

SOURCES OF FUNDING

About 98 percent of RTI's budget comes from City Council discretionary funding. Recent city budget cuts have had a significant funding impact on RTI.

FY 2024: $616,000 from City Council discretionary funding

FY 2023: $876,000 from City Council discretionary funding

FY 2022: $1.3 million from City Council discretionary funding

WHAT MAKES THE PROGRAM STAND OUT?

Renaissance Technical Institute provides free training to adults, regardless of their educational background. Many students are new immigrants and need English language support. Such accessibility makes the programs popular, and there are waiting lists for both the HVAC and Solar Installer programs. "I see a lot of demand for green jobs training in New York City companies, but also a lot of demand from students asking for it," says Hiraldo. Before they can begin Level 1 training in either program, students must complete the NCCER Core Curriculum, which introduces construction concepts and general workplace skills. Hands-on skills training comprises about 60 percent of programs.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

RTI needs funding to hire someone who can connect with employer partners. Waiting for City Council funding, and having to be reimbursed, interferes with cash flow. "I have a waiting list of 6,000 students, and we offer up to 17 different careers. Not getting those fundings on time is damaging us, or is not helping to recruit more students or to open more classes," says Hiraldo.

Graduates also need greater access to union apprenticeship programs, and unions working on NYCHA projects in particular. "NYCHA cannot fix the amount of apartments that they have to fix, because the unions are lacking manpower," he says.

It would also be helpful if developers would partner with nonprofit training providers like RTI well in advance of when projects begin, so that local non-union workers can be identified and trained, Hiraldo says.

Interview with David Hiraldo, Founder & Executive Director

CONSTRUCTION AND BUILDING SYSTEMS

14. RETI Center: Solar Training Program

RETI Center's Solar Training Program provides hands-on training and internships in solar energy to adults living in communities facing environmental injustice.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

45-60 annually. 15-20 per cohort.

DEMOGRAPHICS OF THE POPULATION SERVED

The program focuses on training adults who live in Environmental Justice communities. About 75 percent are graduates of local transition high schools in South Brooklyn and West Brooklyn.

LOCATION OF THE PROGRAM

Red Hook

FREQUENCY/DURATION

The program runs three times per year. The training portion of the program is full-time for three weeks, followed by a six to eight-week paid internship.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

To be eligible for the Solar Training program, participants must be age 18 or older and have a high school diploma or equivalency.

APPLICATION PROCESS

Online application

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The curriculum introduces the science of renewable energy systems, as well as the installation process for solar technology. It also includes OSHA-40 Construction and Site Safety Training, Green Professional Training (GPRO) in Fundamentals of Sustainability, and green entrepreneurship.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Most graduates are placed in paid 80-hour internships, while fewer are placed in jobs.

OUTCOMES

The goal of the program is to prepare graduates for entry-level jobs in solar installation, marketing, and administration. Partner solar companies visit and meet with candidates, often hiring them for paid internships or jobs. Additionally, RETI Center staff maintain relationships with program participants after they graduate to foster community and "collective action," says Wilson.

KEY PARTNERSHIPS

Good Shepherd Services provides case management, career services, and refers most participants. Red Hook Initiative, Red Hook Community Justice Center are partners.

EMPLOYER PARTNERS INCLUDE BROOKLYN SOLAR WORKS, SUNKEEPER, URBAN ENERGY, ACCORD POWER

Non-solar companies that expose students to different industries/jobs:

NineDot (battery storage company), Community Offshore Wind, Vineyard Wind

RETI hopes to eventually add wind and storage training modules.

COST

Free to participants. Participants are paid a $600 training completion stipend, and $15 per hour for 80-hour internships. In 2023, the program will be run through the city's Summer Youth Employment Program, which pays $15 per hour.

SOURCES OF FUNDING

Civ Lab, Good Shepherd Services (for internship dollars via Walentas Family Foundation, the City's Work Progress Program). RETI Center has a community solar initiative in development that should eventually fund the training program, Wilson says.

WHAT MAKES THE PROGRAM STAND OUT?

The RETI Center was created by residents of Red Hook, after Hurricane Sandy hit the low-lying waterfront area hard. They wanted to build a program that would create opportunities for locals to build wealth and climate change resiliency. During the program, students spend 40 hours learning the basics of grid-interactive and battery based solar power systems, 40 hours in OSHA-40 Construction and Site Safety Training, 16 hours on green entrepreneurship, and eight hours on the Green Professional Training (GPRO) in Fundamentals of Sustainability training module. During week two, students go through hands-on training at the RETI Center barge and Brooklyn Solar Works warehouse, learning about battery wattage theory and working in teams on various types of solar installations. In week three, students are introduced to the broader green economy and encouraged to consider different career directions. Three program days are set aside for students to develop entrepreneurship skills. They create their own "social green business" and pitch it to the group, including solar industry professionals working in New York City.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

Connecting with employers for partnerships and to help shape the curriculum is an ongoing challenge. Employers are not always willing to pay interns, but with more flexible grant funding, RETI Center could cover those costs (including internships for students over age 24) and have an easier time approaching potential employer partners, says Wilson. While most RETI Center students are younger, there are some older students who "were set back" during the pandemic and are now being shut out of opportunities, Wilson says.

Interview with Kaila Wilson, former Director of Energy Development

CONSTRUCTION AND BUILDING SYSTEMS

15. RiseBoro: Level Up! Sustainable Building Maintenance Training Program

Level Up! Sustainable Building Maintenance Training Program upskills existing RiseBoro building staff and trains community members to maintain green building components. This program is still in the process of being designed and program leaders are shoring up the necessary sources of funding.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The program will aim to serve about 100 participants per year, or up to 25 participants per quarterly cohort.

DEMOGRAPHICS:

Most participants will be Black or Hispanic individuals who live in vulnerable communities, such as Brownsville and Bushwick.

LOCATION:

The program will take place at RiseBoro headquarters in Brownsville, 1875 Broadway, Brooklyn 11207.

FREQUENCY/DURATION:

RiseBoro aims to offer three to four trainings per year, or one training per quarter.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Existing RiseBoro maintenance/property management staff and community members seeking employment are eligible.

APPLICATION PROCESS

Current building maintenance staff will be referred to the program by RiseBoro Housing. For job seekers from the community, RiseBoro will receive referrals from other programs, or they can contact Level Up! directly to inquire.

CURRICULUM:

The curriculum will focus on sustainable practices for building maintenance, including maintenance of solar panels, solar thermal (hot water) arrays, and Passive House components. Existing staff will acquire Green Professional Training (GPRO) certification from Urban Green Council.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Solar One and RiseBoro will help graduates find work and paid internship opportunities. RiseBoro career coaches assist with interview preparation and various potential employment barriers, from housing to language proficiency.

OUTCOMES

RiseBoro career coaches will track participants' progress during and after the program.

KEY PARTNERSHIPS

Solar One is a training partner. Various housing and construction partners will consider graduates for internships and jobs.

COST:

The program will be free to participants. Participants will be paid a modest stipend and will receive MetroCards for travel related to training.

SOURCES OF FUNDING

RiseBoro has applied for state funding and will supplement with internal support.

WHAT MAKES THE PROGRAM STAND OUT?

RiseBoro developed Level Up! Sustainable Building Maintenance Training to create job opportunities for the local community, as well as ensure its existing staff "have the right skills to manage our portfolio," says Kurtz. Participants who are not RiseBoro staff will be trained in the basics of green building maintenance. Training for RiseBoro staff will emphasize why sustainability is essential, before tackling maintenance of more advanced green building equipment and systems, such as solar photovoltaic and solar thermal (hot water) arrays, and Passive Houses. All participants have an option to earn Urban Green Council's Green Professional Training certification. Financial coaches teach participants about career income potential, with the goal of closing the racial wealth gap and increasing generational wealth.

Interview with Emily Kurtz, Vice President, Housing

CONSTRUCTION AND BUILDING SYSTEMS

16. Rising Stars (RiseBoro/Tremco)

Rising Stars is a green construction exposure and training program for young adults from Brooklyn.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

30-40 annually and 15-20 per cohort (two a year).

DEMOGRAPHICS OF THE POPULATION SERVED

The program serves young adults ages 16 to 24, most of whom are recruited rom Brownsville or Bushwick.

LOCATION OF THE PROGRAM

RiseBoro offices at 1875 Broadway, Brooklyn (Brownsville/Ocean Hill)

FREQUENCY/DURATION

The 8-week (twice a week), 48-hour program is offered two or three times per year.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be ages 16-24.

APPLICATION PROCESS

Application and interview.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The curriculum exposes participants to different facets of the construction industry, including architecture, building trades, project management, and sustainability.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

RiseBoro career coaches provide post-program job readiness support

OUTCOMES

Around 50 percent of participants are either placed in an internship or paid position following completing the program. Additionally, 75 percent or more of participants complete the full training cycle.

KEY PARTNERSHIPS

Tremco

COST

The program is free to participants and they receive a stipend of at least $300 ($25 per session) and MetroCards.

SOURCES OF FUNDING

All funding is from Tremco, which developed the program.

WHAT MAKES THE PROGRAM STAND OUT?

Rising Stars was developed by Tremco, an international construction product company. The program introduces different aspects of the construction industry and various long-term career pathways. Most participants live in Brownsville, where RiseBoro is based, and "have just graduated high school and are looking for some type of career orientation," says Joscelyn Truitt, vice president of empowerment for RiseBoro. Twice-weekly three-hour sessions provide exposure to different building trades, as well as architecture, project management, and sustainability concepts (Urban Green Council GRPO certification emphasizes efficient, sustainable buildings). Construction industry professionals visit

with students throughout the program, which also incorporates hands-on challenges — such as building basic refrigeration systems — and entrepreneurship. The program culminates with a trade week, during which students are connected with an industry mentor, and meet with companies hiring for interns and entry-level jobs.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

To maximize the effectiveness of this program, RiseBoro needs a better understanding of hiring needs in the building sector, including how jobs are changing and which new skills are most needed. While property building and maintenance is increasingly approached through "a sustainable green lens," there's still uncertainty around "where and how the trainings have value," says Truitt.

Making sure that participants can get paid for training is also crucial, especially for the population RiseBoro focuses on. Many have recently faced eviction proceedings or are transitioning from a homeless shelter into affordable housing. They often need extensive support returning to the workforce, and can't afford to attend unpaid training that may interfere with their job.

Interview with Joscelyn Truitt, Vice President, Empowerment

CONSTRUCTION AND BUILDING SYSTEMS

17. Solar One: Green Workforce

Solar One's Green Workforce Program prepares unemployed and under-employed adults for careers in clean energy fields, from renewable energy to green building operations.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

Approximately 500 participants trained annually.

DEMOGRAPHICS OF THE POPULATION SERVED

Unemployed and under-employed adults. Most are ages 20-30 and lack a college degree.

LOCATION OF THE PROGRAM

Solar One training center in Long Island City. Hard-skills training can be at various other locations, from Rikers Island to the Queensbridge Houses in Long Island City.

FREQUENCY/DURATION

Courses take an average of four to six weeks.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Eligibility may depend on the capacity of partner non-profit organizations that handle recruitment, outreach, and wraparound services.

APPLICATION PROCESS

Organizations interested in partnering with SolarOne complete an online inquiry. Partner organizations recruit participants and handle the application process.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The Green Workforce Training program features three main courses for entry-level workers: Green Construction; Green Building Operations & Maintenance; and Solar PV Installation. Additional technical hands-on training and certification programs are available for incumbent workers. Credentials, depending on the course, may include Urban Green Council's Green Professional Training (GPRO): Operations and Maintenance certification, New York City Department of Buildings Site Safety Training, or North American Board of Certified Energy Practitioners PV Associate.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Solar One has a small industry engagement team focused on building employer partnerships for job placements.

OUTCOMES

The program's average yearly job placement rate exceeds 70 percent.

KEY PARTNERSHIPS

Partners have included Fortune Society, Green City Force, St. Nicks Alliance, The HOPE Program, Housing Works, New York City Parks Department, Nontraditional Employment for Women, and WeAct.

COST

The program is entirely free to all participants.

SOURCES OF FUNDING

NYSERDA and other sources.

WHAT MAKES THE PROGRAM STAND OUT?

Solar One has been offering Green Workforce training for the past decade, training more than 4,000 students and establishing long-term partnerships with nonprofit workforce providers as well as some municipalities. Students are recruited by these partners, and Solar One can customize its three primary courses to meet partner needs, such as shorter duration, specific certifications, or "what the partner organizations themselves may focus on, or the areas they're located in," says Levitske.

Courses may include hands-on experience at Solar One's recently opened Long Island City training facility or on off-site projects. Students might install solar panels on a

NYCHA complex, work in groups to build a framed structure with a subfloor, or learn how to calculate energy efficiency improvements in buildings. The program incorporates portable skills that students can take with them from one role to the next, and emphasizes increasing energy efficiency and sustainable practices across all jobs and trades.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

New York State should make it easier for small companies to take advantage of available funding streams for hiring employees and interns from disadvantaged backgrounds. This could help more small companies get connected to programs like Green Workforce, according to Levitske.

Graduates also need more access to union membership. Despite moving to a new, larger facility about a year ago, Solar One already needs more space to continue expanding and launching training programs.

Interview: Max Levitzke,
Senior Director, Green Workforce

CONSTRUCTION AND BUILDING SYSTEMS

18. Soulful Synergy: Willdan Clean Energy Academy

Wildan Clean Energy Academy is a technical training program, offering free courses intended to close skills gaps reported by employers.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

Approximately 1,000 (statewide)

DEMOGRAPHICS OF THE POPULATION SERVED

Primarily low income, marginalized, BIPOC, NYSERDA-categorized disadvantaged communities and priority populations.

LOCATION OF THE PROGRAM

Combination of in-person training and online training statewide, with most hands-on training in Westchester, the Bronx, Queens, and Harlem.

FREQUENCY/DURATION

Programs that are virtual are 30-60 hours mostly, and in person classes are up to 150 hours. Classes will run from 5-8 weeks generally.Virtual

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Must be 18 and over and have a GED/high school equivalency.

APPLICATION PROCESS

Online application, screening interview, selection process.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The Willdan Clean Energy Academy offers an Electrical Course, which includes classes on lighting and HVAC systems, and a Thermal Course, which prepares students for program management roles and focuses on the building envelope, heating, and domestic hot water systems. The program also offers a Clean Heat Course, a Building Envelope Course, and an Urban Handyperson Masteries Program. Preparation for many different credentials is available, depending on the track, from Certified Energy Auditor (CEA) to MultiFamily Building Analyst (MFBA) to Certified Apprentice Lighting Technician

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Soulful Synergy provides careers services, including career roadmapping, resume and cover letter writing, interview prep, and job placement.

OUTCOMES

Graduates have been placed in jobs as energy auditors, as well as in sales and outreach, project coordination, and incentive management around available funding from ConEd and NYSERDA.

KEY PARTNERSHIPS

Willdan, NYSERDA, WeAct,
JCC of Staten Island

COST (e.g., what is the per-participant cost of delivering the program? Does a participant pay anthing for the program?)

The program is free to participants.

SOURCES OF FUNDING

Primarily NYSERDA.

WHAT MAKES THE PROGRAM STAND OUT?

While the Electrical and Thermal courses each focus on different aspects of clean energy systems, both tracks include several classes on the green economy, from an introduction to sustainability and different sectors to market drivers to relevant city and state policies. Additionally, because of the high demand for energy auditors, coursework is aimed at adults who either want to become energy auditors or who are currently working as auditors in commercial energy efficiency programs, such as the Con Edison Small and Medium Business (SMB) Program. Students learn to identify inefficiencies within existing building systems. The program also covers incentive programs and local laws driving the need for energy retrofits and transitions. Participants gain hands-on experience by performing audits, shadowing workers in various energy auditing roles, and using Excel to identify energy retrofit needs.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

Soulful Synergy needs to develop partnerships with nonprofits and universities that can refer participants and provide wraparound services, from mental health services to food assistance to professional development, especially for students who have been unemployed.

Interview with Dwayne Norris,
Director of Outreach & Recruitment
Clean Energy Academy

19. St Nicks Alliance: Skills Training Courses

The Skills Training at St. Nicks Alliance offer training and certifications in Construction, HVAC & Building Maintenance, Environmental Remediation, Data Analytics, Financial Services, and Customer Service.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

372 served annually; 15 to 25 per cohort.

DEMOGRAPHICS OF THE POPULATION SERVED

Adults and young adults (ages 18-24) who are unemployed or underemployed.

LOCATION OF THE PROGRAM

North Brooklyn (Workforce Services held at Workforce Development Center at 790 Broadway, 2nd Floor, Brooklyn NY 11206). All training and programs in person. Hands Technical Training also takes place at training partners' training facilities.

FREQUENCY/DURATION

7 to 12 week including Workplace Success Job Readiness and Internship if applicable. Monthly alumni engagement after graduation and industry mentors for a year post graduation.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Urban Greenscaping participants must be ages 18-24 and Building Maintenance participants must be 18-25. For all other programs, participants must be at least 18 years old.

APPLICATION PROCESS

In-person information session, followed by individual and group interviews.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

St. Nicks Alliance offers industry recognized trainings in Healthcare, Technology, Financial Customer Services and the Green Trades. The Green Trades includes: five skills-training programs focused on preparing adults and young adults for jobs in urban greenscaping, building maintenance, environmental remediation, construction, and maintenance of HVAC systems and buildings. Course curricula combine technical and hands-on training informed by employer and St. Nicks Alliance technical training partners, as well as two weeks of workplace success job readiness training. All courses include OSHA 40 certification. Depending on the course, students can also acquire a range of industry recognized credentials including the Hazwopper 40, GPRO Mechanical, 4-Hour Support Flagger, 4-Hour Scaffolding, 8-Hour Confined Space, Asbestos Handler, Fireguard F-60, G-60, and EPA 608.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Job developers for each program focus on job placement, including roles on St. Nicks' various community development projects. Recruitment events with employer partners, guest speakers from different industries, and site visits help students connect with potential employers.

OUTCOMES

Graduates of Urban Greenscapers have earned building maintenance union jobs. Major development projects, such as the former Domino Sugar Factory, have hired Skilled Build graduates. The HVAC & Building Maintenance program has placed graduates in jobs with Hudson Companies, Broadway Builders, Mega, Two Trees, Trane, and Admiral Air Conditioning.

KEY PARTNERSHIPS

Solar One, New York Safety and Training, Big Apple Training, City Tech. Various supportive services partners for case management, mental health services, food insecurity. Employer partners include Two Trees, Mega Contracting and other construction employer partners who have a commitment to supporting training and local hiring.

COST

The per-participant cost of delivering programs can reach $10,000, depending on the level of support services needed by trainees. Programs are free to participants. Stipends are provided when funding allows. MetroCards are always provided.

SOURCES OF FUNDING

U.S. Department of Labor, New York State Department of Labor, Robin Hood Foundation, Hecksher Foundation, NYSERDA and U.S. Environmental Protection Agency.

WHAT MAKES THE PROGRAM STAND OUT?

After St. Nicks Alliance created its Environmental Remediation training program in 2000, the organization developed relationships with developers, who needed trained workers for various phases of their projects. The organization then expanded its training programs to help meet the demand for skilled workers at every project stage. Students in the Urban Greenscaping program learn to design and maintain green roofs, living walls, and urban parks. Skilled Build, a construction-focused program, incorporates training for several credentials, from Flagger to Solar One Green Construction Certificate, increasing their chances of finding work on a development project. The HVAC & Building Maintenance program has led to job placements with developers, like Two Trees, and energy-efficiency companies, such as Admiral Air Conditioning.

"We can help employers with the different phases of a project. So they're breaking ground, and need to remediate; we can give them some environmental remediation staff. Then they'll need general laborers, we can do that later on. They might need electrician helpers, plumber helpers, that we can help with," says Rothchild. For example, Two Trees Domino Project has hired about 115 people trained by St. Nicks Alliance during the last few years, while also assisting with hands-on training for the Urban Greenscaping program at Domino Park.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

"There's huge demand" for construction staff, while HVAC training represents "a big growth opportunity," says Rothchild. To respond to the needs of employer partners and trainees, St. Nicks needs funding for programs – including flexible funding to cover job readiness skills, not just technical training – job development staff, case management, and trainee stipends. More funding could also help the organization meet the growing demand for green customer service and building maintenance workers, both for St. Nicks' affordable housing developments and its construction and developer partners.

Interview with Larry Rothchild, Director, Workforce Development

CONSTRUCTION AND BUILDING SYSTEMS

20. Stacks & Joules

Stacks & Joules is a technical training program that prepares youth and adults for careers as building automation system technicians.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The program serves about 60 adults (20 per cohort, including one all-women cohort that will start in May) and 75 high school students (25-50 per cohort, with 10 in an all-girls cohort) annually.

DEMOGRAPHICS OF THE POPULATION SERVED

High school juniors and seniors, and adults ages 24-34 who are people of color, recent immigrants, and/or earn low incomes.

LOCATION OF THE PROGRAM

Manhattan/Lower East Side: Henry Street Settlement, Civic Hall, Urban Assembly Maker Academy, City-As-School High School

FREQUENCY/DURATION

The Adult program is 12 weeks long/192 hours (four days per week; four hours per day).

The Youth program is 180 hours long, including in school and external internships.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

None.

APPLICATION PROCESS

An interview process screens for level of interest and commitment.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The curriculum is focused on training to become a building automation system technician. There are three technical learning components, including programming for lighting controls, HVAC system fundamentals, and system integration using a building systems software known as the Niagara Framework. Students can acquire a Certificate in Introduction to Lighting Controls from the Lighting Controls Association of America, and EPA 608, a refrigerant handling and safety certification. Professional skills are woven into the technical training.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Partner organization Henry Street Settlement has established programs to connect trainees with jobs. Some graduates are ready for employment or internships, while others need additional training first.

OUTCOMES

52 of 53 adult graduates are employed full time, with 76 percent working in building automation fields.

KEY PARTNERSHIPS

Henry Street Settlement

Lower East Side Employment Network (LESEN)

Civic Hall

Current high school partners include Urban Assembly Maker Academy and City-As-School High School

Industry partners include TEC Systems, Climatec, Tridium, NORESCO, Dual Fuel, Environet Systems, Smart Buildings Academy, Realcomm, Google

COST

The program is free to participants. Participants in the all-girls cohort earned $15 per hour. Other cohorts were mostly unpaid, with some work-study assistance available for adult program participants through Henry Street Settlement. The per-participant cost of delivering the program is about $7,500.

SOURCES OF FUNDING

Major funding from NYSERDA and Green Economy Fund. Additional funding from Autodesk Foundation, Google, Realcomm, and individual contributions.

WHAT MAKES THE PROGRAM STAND OUT?

Stacks & Joules is one of few training programs focused on building automation. The program takes an experiential approach that mimics a work environment. Students begin with hands-on, project-based learning, before segueing into technical training. They learn how to use Python to control a bank of wireless LEDs, acquiring skills that transfer to lighting controls. Next, they focus on HVAC fundamentals, such as heat transfer and the refrigeration cycle, before learning how to operate and control HVAC systems. The system integration component is the "longest and most complex" part of training, when students learn the software that recognizes energy usage patterns across different building systems. High school programs include an after-school internship with an industry partner for "work on real projects," Conway says. Collaboration, communication skills, and

professional readiness are woven throughout the program.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

Building automation control is an emerging technology field with “exceptional demand” for talent, says Conway. To help meet that need, the program needs more funding so that it can train more instructors. Some of the current instructors are volunteer industry professionals, but Stacks & Joules also trains program graduates to become instructors, a process that takes about a year. "Our greatest challenge to expanding our programs is the facilitators, the trainers. The industry itself can't find the talent it needs, so hiring that talent to do training [is difficult], Conway says.

Interview with Michael Conway, Founder & President

CONSTRUCTION AND BUILDING SYSTEMS

21. Youth Action YouthBuild: Building Operators Training Program

Youth Action YouthBuild provides hands-on training in efficient building operations for unemployed or underemployed young adults from Upper Manhattan and the South Bronx.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

30 to 45 annually. One cohort per year.

DEMOGRAPHICS OF THE POPULATION SERVED

Ages 17 to 30, from Upper Manhattan and the South Bronx.

LOCATION OF THE PROGRAM

Youth Action YouthBuild in East Harlem, with hands-on experience at their portfolio of low-income housing buildings, and internships at other multifamily buildings.

FREQUENCY/DURATION

9-month program from September through June. Taylor hopes to extend the program to two or three years. 120 hours of certification training and 160 hours of internships.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Must be legally able to work in the U.S.

APPLICATION PROCESS

Online application

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The program uses the Building Science Principles as a foundation course. Participants earn Building Science Principles certificate from the Building Performance Institute (BPI). Participants can also earn the BPI Health Homes certificate as an additional certificate.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Some graduates have been placed in jobs with partner employers that own multifamily buildings.

OUTCOMES

About 65 percent of participants complete the program.

KEY PARTNERSHIPS

Curriculum partners: Association for Energy Affordability

Internship partners include building management companies: Taino Towers and Concord Management.

COST

Total cost of delivering program to 15 students: approximately $240,000

Free for participants. Participants are paid a $28 daily stipend during training, and $17 per hour for internships of up to 20 hours per week for up to eight weeks.

SOURCES OF FUNDING

Pilot program funding from the U.S. Department of Labor and the New York City Department of Youth and Community Development.

WHAT MAKES THE PROGRAM STAND OUT?

Youth Action YouthBuild was created to address a challenge facing New York City building operators, who need to upgrade their buildings to meet new standards, but are losing workers to retirement. “We saw an opportunity to begin training a new generation of workers for the building sector who have a particular focus and preparation around energy efficiency and building efficiencies,” Taylor says. Participants spend classroom time focusing on CUNY’s foundations in building science curriculum and then are trained by the Association for Energy Affordability (AEA) to earn the Building Science Principles certificate from the Building Performance Institute (BPI). Participants then gain hands-on experience working in low-income housing managed by Youth Action YouthBuild and complete an eight-week internship in a building setting. Going forward, the program intends to focus on connecting participants with employers as soon as they enroll, until they find internships and jobs.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The program needs more employer partners, and better engagement between employers and participants, who often lack professional experience and need time to adapt. The city could help by supporting "more matching between providers and

employers, whether that comes directly from the employer guilds, or the city's Small Business Administration," Taylor says.

The organization also needs funding to provide wraparound services for participants in their 20s, who often need more intensive mental health services, case management, foundational training, and workplace readiness. Cash flow constraints, due to reimbursable grants, have made it more difficult to pay participant stipends.

Interview withRobert Taylor, Executive Director

AGRICULTURE

22. Farm School NYC Citywide Program

The Farm School NYC Citywide Program prepares adults for work in community-based agriculture and the food justice movement. The program is in a state of revision, the details of which will be available in the next year.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The program serves 40 participants annually. This number is subject to change by 2025.

DEMOGRAPHICS OF THE POPULATION SERVED

The program prioritizes serving BIPOC adults.

LOCATION OF THE PROGRAM

The program has been offered in a hybrid format for the past few years, with online learning sessions and on-site training at community gardens and farms in Manhattan, Brooklyn, Queens, and the Bronx. Before the pandemic, in-person training was held largely at the People's Forum.

FREQUENCY/DURATION

The program is on pause until 2025, as Farm School reviews the format and content of the program and makes updates. It has been a one-year program that includes a once-weekly 2.5-hour classroom learning session and 4-hour Saturday session at a community farm or garden or online.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be 18 or older and live in New York City (some New Jersey and upstate residents have been accepted). The program prioritizes Black, Indigenous and People of Color (BIPOC) applicants and people who have demonstrated some food/social justice work experience and plan to bring what they learn back to their community.

APPLICATION PROCESS

Applications have written and voice or video components and are reviewed by current staff, instructors, and program alumni, followed by an interview. The program aims to accept participants representing different age groups, boroughs/neighborhoods, and levels of experience.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Participants are prepared for careers in the food justice movement through modules in food justice, botany, propagation, growing healthy soil, carpentry for urban agriculture, irrigation, crop management, and small farm design.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

There's informal job-search assistance, including shared listings and help connecting with alumni.

OUTCOMES

Some graduates get paid apprenticeships with Hattie Carthan Community Garden in Bedford-Stuyvesant, Brooklyn and Rock Steady Farm in Millerton, NY, which was started by a program graduate. Others have started their own farms or garden consulting practices, or are working for Queens and Brooklyn Botanical Gardens, managing urban and rural farms and farmers markets, or working in food service and distribution.

KEY PARTNERSHIPS

Apprenticeship programs with Rock Steady Farm and Hattie Carthan Community Garden. Other partners include New York and Queens Botanical Gardens, Earth Matter, NYC Parks-GreenThumb, True Love Seeds, Queens Farm, and various other community farms and gardens in NYC and upstate.

COST

The per-participant cost of running the program is $17,000. Participants pay what they can afford through the program's sliding scale "gift economy" approach. Students contributes in the way that best suites them, from paying what they can to offering their skills.

SOURCES OF FUNDING

STUDENTS PAY FOR THE PROGRAM, BUT FARM SCHOOL ALSO DOES FUNDRAISING TO BE ABLE TO COVER PROGRAM COSTS.

WHAT MAKES THE PROGRAM STAND OUT?

Farm School NYC was started by a group of land stewards, educators, and activists who didn't see communities of color reflected in the curriculum of existing agriculture and food-related education programs. The Citywide Program uses the Popular Education Model, a horizontal learning approach that incorporates participants' knowledge and lived experience. The program aims for participants' learning to "spiral out into larger intersecting communities," says program steward Dyaami D'Orazio.

There are 11 modules throughout the year, which altogether prepare students for careers in the food justice movement, from activism and organizing to farming, gardening, teaching, or project management. During in-person sessions at community farms and gardens, participants tour the grounds and get hands-on experience individually and in small groups. They also help underfunded community gardens however needed, such as weeding, organizing supplies, or building necessary equipment, such as three-bin compost systems or drip- irrigation infrastructure.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

Farm School NYC needs more unrestricted funding to be able to expand its paid apprenticeship program to additional sites, build a stronger alumni support network, as well as provide more job placement support for graduates.

Rent-free access to unused city-owned land and buildings in each of the boroughs would also be helpful. When it's raining, the program struggles to find covered spaces, especially for intensive courses like carpentry, which requires electricity and many tools.

Investments in living wages and affordable housing, both upstate and downstate, would be helpful to students and alumni, who often find work at farms in both locations.

AGRICULTURE

23. New York Sun Works: High School Controlled Environment Agriculture (CEA) Farming Certification Program

The High School Controlled Environment Agriculture (CEA) Farming Certification Program teaches students technical hydroponic farming skills needed for internships and entry level jobs.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The program served about 150 students during its first full year. The program served about 165 students for the 2023/2024 school year.

DEMOGRAPHICS OF THE POPULATION SERVED

The program serves a population of New York City public high school and transfer school students, ages 14-22. Most participants are juniors and seniors. 89 percent of participating schools are Title 1.

LOCATION OF THE PROGRAM

For the 2023/2024 school year, the program is running either as a semester long or a year long course in 9 public high schools: in Brooklyn - K617, K344, K531, K525, K540; in Manhattan - M570, M551; in the Bronx - X267; and in Queens - Q425

FREQUENCY/DURATION

The SYEP program is a 6-week, 120-hour program (4 days a week, 5 hours of instruction per day). School year programs vary based on class schedule; the spring pilot was 18 weeks, daily, 45-90 minutes per day. The full year course is 36 weeks, daily, 45-90 minutes per day.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Students must be enrolled in a high school that is participating in the program.

APPLICATION PROCESS

During the school year, students must request to be in the elective course.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Students learn the components of hydroponic farming systems, in which plants are grown in water, but no soil. They learn how to maintain and troubleshoot these systems, how to control the environment to optimize plant growth, and how to care for and maintain various cash crops from seed to harvest. Students earn a Controlled Environment Agriculture (CEA) certification from NY Sun Works.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

The curriculum incorporates resume and cover letter writing, professionalism/ workplace readiness, and students attend a career and college networking event and a spring career fair. A fall career fair with CUNY, SUNY, and HBCUs is in development. Graduates and current students are invited to career/college events. The organization is developing a larger career directory with opportunities throughout the Metro area, including CEA jobs as well as roles in composting, food handling, and other related fields.

OUTCOMES

10 students have applied to LaGuardia Community College's environmental science program after attending a college tour through the program. Others are pursuing degrees through SUNY College of Environmental Science and Forestry. Another graduate got a residency with FoodCorps, a non-profit nutrition program. Graduates have been interviewed for part-time positions with New York Sun Works.

KEY PARTNERSHIPS

City Growers at Brooklyn Grange (for commercial farm visits), LaGuardia Community College (students learn about their 2-year programs), and Kingsborough Community College where NY Sun Works CEA students and graduates can enroll in an Advanced Hydroponics and Introduction to Soil Farming Micro Credential starting this spring. Partnerships with Kingsborough Community College, NYC Department of Parks and Recreation, Gotham Greens, and Earth Matter are in development.

COST

The per-participant cost of delivery depends on the program (semester elective or full year course) and other factors can range from $500-$1000. Students do not have to pay anything for the program.

SOURCES OF FUNDING

Some schools pay for the program through their budgets. NY Sun Works has also applied for and received funding from other sources, including grants from the U.S. Department of Agriculture and federal funding through the U.S. Department of Education. New York Sun Works applies for grants to help subsidize school budgets whenever possible.

WHAT MAKES THE PROGRAM STAND OUT?

New York Sun Works has brought hydroponic labs and education to hundreds of New York City public schools since 2010. The CEA certification program, launched in 2022, is being offered in a growing number of those schools. The organization brings the technology, curriculum, and training to teachers. Students learn technical hydroponic gardening skills, including how to operate and maintain the technology and care for specific cash crops. The CEA certificate positions students for further study, as well as immediate internships or entry-level jobs in greenhouses and hydroponic farms, such as Gotham Greens. Students also learn about aquaponics and composting, skills aligned with the Mayor's sustainability efforts.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The organization needs more funding to be able to continue expanding and improving the CEA program. For instance, providing schools with a hydroponic farming expert has received "a great response" from teachers and students, and the organization needs funding to hire more experienced hydroponic farmers and provide more advanced training of existing staff.

They also need more data on hiring needs in the controlled environment agriculture sector, which they know is growing. This would help them be able to partner with more schools and train more students.

Interview with Hannah Luna, CEA Certification Manager & High School Curriculum Specialist; and Manuela Zamora, Executive Director.

AGRICULTURE

24. Queens County Farm Museum: Green Workforce Development Program

The Queens County Farm Museum's Green Workforce Development Program provides paid entry-level training for New York City adults who want to pursue agriculture-based careers.

NUMBER OF PARTICIPANTS PER COHORT/PER YEAR

5

DEMOGRAPHICS OF THE POPULATION SERVED

18 and older.

LOCATION OF THE PROGRAM

Queens County Farm Museum

FREQUENCY/DURATION

The 40-week program is offered once per year. Participants are hired as full time seasonal workers, from early April until mid-November. There is no support for alumni.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

None. No experience or degree needed. It's an active, physical job working on the farm, so they need to be comfortable with and capable of that.

APPLICATION PROCESS

Cover letter, references, and resume required, followed by a farm visit.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Participants learn about growing food and how to operate farm equipment. Visiting lecturers cover a range of agricultural topics, based on trainees' interests.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Not offered.

OUTCOMES

Most trainees continue working in agriculture and gardening-related jobs.

KEY PARTNERSHIPS

Cornell Extension NYC

COST

Participants are paid $20 per hour.

SOURCES OF FUNDING

They were not able to provide this information.

WHAT MAKES THE PROGRAM STAND OUT?

The program is open to anyone with an interest in farming or a desire to learn about farming, regardless of their level of experience. Trainees are hired as seasonal employees. This year, the program has intentionally sought to recruit people with less experience in farming. They learn about planting crops and scouting for disease, as well as how to operate common farm equipment, including driving a tractor. Additionally, with assistance from Cornell Extension NYC, outside experts will be identified to lead workshops covering topics chosen by trainees, such as no-till farming, which can help prevent erosion. Trainees also take field trips to experience workshop topics firsthand, such as a farm on Long Island that uses no-till production. Graduates have gone on to start their own farms or work on other farms in New York State, or found employment as farmer-gardeners in landscape design and at farmers markets.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

With more funding, the program could bring a wider range of experts to the farm for workshops. One expert in a specific kind of tractor was too expensive, for instance. With greater support, Queens Farm could expand its role as a connector and learning center for urban farmers from throughout the city. Morales also sees an opportunity for the city to create more jobs that utilize farming skills, such as hiring people to transform underutilized green spaces for growing food, or to design and build landscape features that protect against climate change impacts.

Interview with Danny Morales, Director of Agriculture. Morales runs the program, taking applications. Hiring/interviewing, and developing curriculum.

EDUCATION

25. CUNY Climate Scholars

NUMBER OF PARTICIPANTS SERVED ANNUALLY:

Approximately 16 annual participants: 14 CUNY Immersive Research Experience (CIRE) Climate Scholars and two CIRE – Climate Scholar Coordinators

Demographics of the population served: CUNY students from low-income and historically marginalized communities.

LOCATION OF THE PROGRAM:

Baruch College, Bronx Community College, Brooklyn College, and Hunter College

FREQUENCY/DURATION :

The program is offered once annually and lasts for 9 months, including a fall semester research project and twice-weekly lectures, followed by spring semester internship. Alumni receive ongoing career support.

ELIGIBILITY CRITERIA FOR PARTICIPANTS:

Must be a CUNY undergraduate student. One student from each of CUNY's senior colleges and one student from each of three CUNY community colleges for a total of 14 student Climate Scholars.

APPLICATION PROCESS:

Online application

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The science of climate change, climate change impacts in New York City, and science-based solutions for building greater climate resilience. Also includes weekly didactic sessions, three months in a climate research lab, three months in a climate-related internship, and mentorship of and discussion with STEP Academy middle school and high school students in climate change impacts and strategies for resilience.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Baruch's Starr Career Development Center is attentive to climate career opportunities, which are sent to all climate scholars from past and current cohorts. A "climate change at Baruch" website with jobs, internships, careers listings is in development.

OUTCOMES

Students have interned with a range of advocacy groups, media organizations, and scientific institutions, such as the Environmental Defense Fund, InsideClimate News, and Brookhaven National Laboratory. Fellows have gained hands-on experience with coastal rehabilitation, traveled to Mumbai to study air pollution, and pursued graduate degrees in climate finance.

KEY PARTNERSHIPS WE MAINTAIN CONNECTIONS WITH THESE PARTNERS

Sustainable CUNY, CUNY Building Performance Lab, Baruch College, Bronx Community College, Brooklyn College, or Hunter College

COST

Cost of delivering the program: $7,500 per participant, $17,000 per coordinator. Free to participants. Students are paid a $7,500 stipend. Research mentors are given a $500 stipend. Mindy Engle-Friedman is not paid.

SOURCES OF FUNDING

First-year funding from CUNY Office of Research; second-year funding from CUNY Office on Workforce Development; third-year funding from New York City Economic Development Corporation (NYCEDC); fourth year funding from Bloomberg Philanthropies. This upcoming

year (2024-2025), the CIRE – Climate Scholars program will be support by CUNY, Bloomberg Philanthropies and private donor/Baruch alum, Paul Rothman.

WHAT MAKES THE PROGRAM STAND OUT?

CUNY Climate Scholars combines research with paid internships and lectures by CUNY faculty and professionals working across various climate-related fields, from finance to green energy. The goal is for students to obtain a well-rounded understanding of climate change science, and especially climate impacts and science-based solutions in New York City.

During the fall, students undertake climate-related or green energy research at a CUNY lab, which they later present at Baruch's annual Research & Creative Inquiry Expo and the International Conference of Undergraduate Research. Projects have ranged from climate-induced migration to climate impacts on human behavior. During the spring, students hold off-campus internships, ranging from coastal restoration to climate-related data journalism to environmental, social, and governance (ESG) investing. Scholars are mentored by CUNY climate scientists and graduate students in societal climate resiliency. They also meet with incoming CUNY freshmen, and middle and high school students attending Baruch STEP Academy, to teach them about climate change and related career paths.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The program needs funding in order to expand to additional CUNY schools, as well as expand its focus to include engineering. Engle-Friedman hopes to bring City College and City Tech into the program because of their engineering focus, but she is running the program almost by herself and without pay. A greater emphasis on climate change across CUNY would also help prepare students for related careers, and help the program grow.

Interview with Mindy Engle-Friedman, Professor of Psychology, Baruch College. Engle-Friedman directs the program.

EDUCATION

26. Green City Force: Service Corps

Green City Force Service Corps is an AmeriCorps National Service program that engages young adults for environmental service and training in New York City affordable housing communities.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

About 100+ per year; 50 per cohort.

DEMOGRAPHICS OF THE POPULATION SERVED

18 to 24 year olds from public and affordable housing communities

LOCATION OF THE PROGRAM

Eco-Hubs, or urban farms, in NYCHA communities. The program currently has six Eco-Hubs: Wagner Houses Eco-Hub in Manhattan, Howard and Bay View Houses Eco-Hubs in Brooklyn, Forest Houses Eco-Hub in the Bronx, Astoria Houses Eco-Hub in Queens, and Mariners Harbor Houses Eco-Hub in Staten Island. The program also has a central office in Brooklyn.

FREQUENCY/DURATION

Six months. Offered twice per year.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Must live in low-income housing; GED; U.S. citizen or legal resident status; no more than 60 college credits; not enrolled in college full-time.

APPLICATION PROCESS

Online application.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Roots of Success, an eco-literacy curriculum that trains youth and adults for jobs and careers in environmental fields. Occupational Safety and Health Administration (OSHA) 40-hour training provided.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

The program includes career pathway trainings, resume prep, and interview practice. Participants meet with corporate volunteers and take field trips to work sites. Job placement and retention staff provide long-term career advancement support.

OUTCOMES

Depending on their preferred career track, participants might take a full-time job, temporary contract role, or seek additional training. Many graduates are working as energy auditors. Others have specialized in urban agriculture, solar installation, community outreach, or green infrastructure.

KEY PARTNERSHIPS

AmeriCorps; JobsFirstNYC Green Economy Network; NYCHA Office of Resident Economic Empowerment and Sustainability (REES), NYCHA Office of Sustainability, NYCHA Office of Community Health Initiatives, NYCHA Office of Resident Engagement, NYCHA Office of Property Management, NYCHA Office of Intergovernmental Relations, NYCHA Office of Communications, and NYCHA Executive Office.

COST

Free for participants. Monthly stipend and unlimited monthly Metrocard provided.

SOURCES OF FUNDING

Roughly one third of program costs are covered by AmeriCorps. Additional support from NYSERDA, New York City Council, and The Office of Neighborhood Safety, an initiative of the Mayor's Office of Criminal Justice. The program also has philanthropic, corporate, and individual funding as well as fee-for service contracts revenue.

WHAT MAKES THE PROGRAM STAND OUT?

Green City Force Service Corps engages young adults to build climate resilience in their own communities, which are being disproportionately affected by climate change. Based largely at EcoHubs–urban farms within NYCHA developments–the program introduces sustainability concepts, from energy conservation to reducing carbon emissions by growing and composting food. Hubs provide fresh food for resident farmstands, while supporting pollination, and providing stormwater management through rainwater harvesting and permeable pavement. Participants meet with community members to spread awareness of energy consumption and how to reduce usage, positioning young people as “an asset to drive change,” says Gayle.

The Service Corps curriculum is trauma-informed and responds to the needs and challenges of environmental justice communities. During weekly community meetings, Corps members practice communication and engagement skills, share outcomes and accomplishments, learn about anti-racism, and practice giving feedback to and receiving feedback from supervisors and others. Graduates can access long-term support as they navigate their careers.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

Graduates need more access to union pre-apprenticeship programs, which lead to stable, well-paying union jobs. "Some have gone into union tracks, but not enough. We need more,” says Executive Director Tonya Gayle.

The organization needs multiyear, unrestricted funding to increase pay for participants and grow the program.

Interview with Tonya Gayle, Executive Director

ENERGY

27. Bridge to Offshore Wind/CUNY Offshore Wind Advisory Network

Bridge to Offshore Wind is a soon-to-launch offshore wind industry exposure program for adults from underserved communities.

BACKGROUND:

The CUNY Offshore Wind Advisory Network includes Kingsborough Community College, City Tech, LaGuardia Community College, and the College of Staten Island, which came together to better direct workforce requests/inquiries from the offshore wind employment partners, like Vineyard Wind and Equinor. The Network is applying for grants together, including funding from Equinor for community engagement, which the Network intends to use for the Bridge to Offshore Wind program. “So when an employer partner says, ‘I need 10 engineers, five turbine technicians. I need captains for the vessels, I need electrical workers. We can say, ‘Well, we have four schools that can provide the training for everything that you need,’” says Zagari-LoPorto.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

Bridges to Offshore Wind will provide cohorts of 20 students per session, hosted at each of the campuses for the next 3 years. Each college will host a total of at least 7 sessions; The consortium numbers are 160 in year 1, 240 in year 2, and 160 in year 3, providing a total of at least 560 enrolled over the next 3 years.

DEMOGRAPHICS OF THE POPULATION SERVED

New York City’s underserved, traditionally marginalized, urban population, particularly those residing in environmental justice communities.

LOCATION OF THE PROGRAM:

The CUNY OSW Advisory Network (OWAN), a consortium of four CUNY campuses: Kingsborough Community College (KCC), LaGuardia Community College (LAGCC), New York College of Technology (City Tech) and The College of Staten Island (CSI) will each host the Bridges programs. They will take place on the 4 campuses as well as being offered on-site with our partners which includes many Community-based organizations throughout the 5 boroughs. The program is best offered live and in person, but a hybrid model is available.

FREQUENCY/DURATION

OWAN has created 2 versions of the Bridges seminar- a 12-hour and 2-hour program. The 2-hour is a short overview, best for CBO partners and industry. The 12-hour is an in depth introduction and overview of Offshore Wind Energy and includes guest speakers and subject matter experts from the industry.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

None. Best suited for High School level and above.

APPLICATION PROCESS

Each campus will have a coordinator on-site to schedule and place interested applicants into upcoming seminar sessions. Additionally, people can sign up with our interest form on the program's website.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The program provides participants the opportunity to explore offshore wind career titles and pathways, as well as the education and training requirements to enter offshore wind careers. Students will review labor market information and employment projections and assess their existing skillsets to evaluate how they align with careers in offshore wind. Students will hear about existing job training, certification, and degree programs that are available at the 4 CUNY schools and how these programs might help direct their career and educational trajectory. Those who complete the workshop will receive direct referrals to the training programs available at each of the consortium schools.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Not applicable. "This is more about getting them onto the pathway for job training," says Zagari-LoPorto.

OUTCOMES

None yet.

KEY PARTNERSHIPS

City University of New York

Equinor

New York City Economic Development Corp.

Vineyard Offshore LLC

Ørsted

Opportunities for a Better Tomorrow

Jobs First- Green Economy Network

COST

Approximately $110 per-person cost to deliver the program, with no cost to participants.

SOURCES OF FUNDING

CUNY CENTRAL AWARDED OWAN $100,000 FOR CURRICULUM DESIGN.

Eco-System Fund awarded OWAN $900,000 for Bridges to Offshore Wind for three years.

WHAT MAKES THE PROGRAM STAND OUT?

The program is intended to help people from traditionally underserved communities get on the path to training for offshore wind industry jobs, regardless of their educational background. Participants will learn about different wind industry jobs, including salaries and skills requirements. The program will emphasize transparency about an industry that remains opaque to many people, making clear that some jobs demand weeks away at sea, or involve climbing tall wind turbines. Those who are interested in pursuing more formal training will be guided to one of the four CUNY schools in the Offshore Wind Advisory Network. "A participant can say, 'I'm interested in this. Now, what do I do?' We want those particular career tracks to lead them into each campus," says Zagari-LoPorto.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

To succeed, the program needs to help build greater public awareness of the offshore wind industry, especially of maritime-focused positions, like captains and deckhands for vessels that transport materials and equipment to offshore wind turbines.

It would also help if the City dropped certain drug testing requirements for maritime positions. Maritime workers must have a federal Transportation Worker Identification Credential (TWIC), a Merchant Marine Credential that requires drug testing and prohibits cannabis. This will be "the biggest hurdle I'm going to come across," in terms of recruitment for the program, says Zagari-LoPorto.

Interview with Christine Zagari-LoPorto, Associate Dean, Workforce Development and Continuing Education, Kingsborough Community College

28. City Tech Energy Storage Training Program

City Tech Energy Storage Training Program prepares low-income adults for entry-level careers in energy storage, and trains incumbent green energy and construction professionals to work with battery energy storage systems.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

When funded, the program serves about 50 participants annually.

DEMOGRAPHICS OF THE POPULATION SERVED

The entry-level program serves low-income adults from underserved communities. The advanced program serves incumbent electricians and solar installers. A tuition-based class serves solar installers and members of IBEW 3, the electrical workers union.

LOCATION OF THE PROGRAM

The program is presented in a hybrid format. Students learn in a remote classroom, study online, and meet for installation experience at CUNY's Energy Storage Container at the Brooklyn Navy Yard.

FREQUENCY/DURATION

The entry-level course is 125 total hours in length. The advanced course and tuition-based course are each 40 total hours in length.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Entry-level program participants must demonstrate 8th-grade math skills, basic electrical or construction skills, and earn below $60,000 per year (most earned very low incomes). Advanced program participants are mostly green energy or construction professionals, though some entry-level workers have joined.

APPLICATION PROCESS

Applicants submit an online application. Selected applicants are screened and then interviewed virtually before final selection.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The entry-level course covers the technical skills and theory needed to start a career in energy storage, including an introduction to distributed energy generation, OSHA 40-hour training, math and electrical calculations, energy storage design and installation, and workforce readiness. The advanced class incorporates hands-on, experiential training in battery storage systems at an indoor and outdoor lab.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

The program provides job search assistance and participants attend an online job fair.

OUTCOMES

Outcomes are not being formally tracked. Five students returned to take a solar PV associate class.

KEY PARTNERSHIPS

New York City Department of Citywide Administrative Services (NYC DCAS) Energy Management Institute, Sustainable CUNY, Aeon Solar, EnelX, NY Best, LiveSolarNYC, AltPower, Brooklyn Solar Works, IBEW Local 3, CUNY ACE

COST

The entry-level and advanced NYSERDA-funded courses are free. The per-participant cost of delivering the program is $3,995 for the entry-level course and $1,375 for the advanced course.

SOURCES OF FUNDING

The entry-level and advanced courses received 70 percent of their funding from a NYSERDA Energy Efficiency and Clean Technology Training (PON 3981) award ($130,638) with a 30 percent cost share.

WHAT MAKES THE PROGRAM STAND OUT?

There are few opportunities for adults to access entry level training in battery storage, as the field is only just emerging. "We might have been the only venue in the city that offered training," says Salomon, regarding when the program was first offered in 2019. Using a NYSERDA grant, City Tech was able to build a battery storage container at the Brooklyn Navy Yard. Because the container is powered by a rooftop solar array and has a heat pump, "It's a really good teaching example of the whole process, not just the storage, but distributed generation, collecting the energy, how it gets used," says Salomon.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The program would benefit from an industry standard certification, or a micro-credential, to encourage more people to seek out training, like they have for solar. They also need grant funding for all three programs to continue.

Interview with Debra Salomon, Director of Program Development, City Tech Continuing Studies Center; and Carol Sonnenblick, Dean, Division of Continuing Education at City University of New York

29. Jamaica Bay Wetlands Fellowship

The Jamaica Bay Wetlands Fellowship is a wetlands management skills training program for young adults living in the Jamaica Bay watershed.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

12 fellows will be onboarded for 2024. The Conservancy hopes to expand the program next year and the following year.

DEMOGRAPHICS OF THE POPULATION SERVED

All fellows live in the Jamaica Bay watershed and are ages 18-25. 40 percent are female, 60 percent are male, 50 percent are white and 50 percent are non-white. 33 percent have no college experience; 42 percent are college graduates; 17 percent have some college experience.

LOCATION OF THE PROGRAM

Training is held at JBRPC offices and in the field at various locations around Jamaica Bay.

FREQUENCY/DURATION

The fellowship is a six-month, part-time program held from March through August.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be between ages 18-25, live in the communities surrounding Jamaica Bay, and willing to work in uncomfortable conditions outdoors in the heat and cold. A high school degree is required.

APPLICATION PROCESS

There's an online application followed by an interview. This past year, 12 out of 64 applicants were selected for the fellowship.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The curriculum centers participants' local experience and scientists' technical knowledge. Fellows are oriented to Jamaica Bay and receive training in maintenance and management of tidal wetlands and nature-based restoration projects.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

The program will follow the job placement model used by the conservancy when it hosted a NYC Parks Conservation Corps internship program, which placed all graduates into jobs. Fellows will be trained in resume writing, job readiness, and financial literacy.

OUTCOMES

Last year was the first cohort of the program.

KEY PARTNERSHIPS

Science & Resilience Institute at Jamaica Bay, a CUNY Institute at Brooklyn College

NYC Parks, NYS Parks, National Parks Service

COST

The per-participant cost of delivering the program is approximately $25,000. There's no cost to participants. Fellows are paid $20 per hour.

SOURCES OF FUNDING

Program funding comes from local City and State elected officials, and private philanthropy.

WHAT MAKES THE PROGRAM STAND OUT?

The Wetlands Fellowship is playing a small, but crucial role in building up a local nature-based workforce in Jamaica Bay, home to an 18,000-acre wetland estuary. “We saw a need for a workforce that didn't come and go, and that was dedicated to the specific needs of a wetland environment,” says Stoehr. While major efforts are underway to build and restore this rapidly eroding resource, maintenance has been overlooked. “Nature-based solutions are not self-sustaining. These are managed spaces, and they need to be managed long term,” says Stoehr. Fellows are meeting that need, helping to plant tens of thousands of seedlings in a vulnerable living shoreline, removing more than two tons of marine debris from a critical marsh meadow habitat, and building wave breaks out of leftover Christmas trees. “We are now so booked with jobs for these eight incredible young people. The agencies have very quickly integrated them into their workforce plan,” says Stoehr.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The program is seeking additional funding to be able to expand. Other challenges include the insufficient number of nature-based jobs, particularly wetlands-focused roles, given the importance of these environments for the City's carbon sequestration, flood protection, wildlife habitat, and as parkland for recreation and human connection.

In addition, wetlands-focused job titles are lacking in government agencies, says Carta. Because agencies lack flexibility to create new job titles, they might put out an ad for a "nature-based solutions manager" when they really need someone to manage and maintain wetlands. This can prevent people without certain academic experience or degrees from applying for or being considered for these jobs, even though in reality the job skills don't demand a higher degree and can be learned on the ground, Carta says.

Interview with Terri Carta, Executive Director, Jamaica Bay-Rockaway Parks Conservancy; and Elizabeth Stoehr, Jamaica Bay-Rockaway Parks Conservancy (JBRPC) Assistant Director

30. Natural Areas Conservancy Internships

The Natural Areas Conservancy Internship Program is a paid opportunity for CUNY students and high school students to gain hands-on experience managing urban natural areas.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

25 to 30 annually

DEMOGRAPHICS OF THE POPULATION SERVED

Interns are CUNY students and "mirror the demographics of New York City." 2022 cohort was 8% Asian or Pacific Islander; 30% Black; 19% Hispanic or Latinx; 36% White; 8% Multi.

LOCATION OF THE PROGRAM

Natural Areas Conservancy office in Manhattan (East Harlem) or Long Island City, Queens. 75 parks with forests and wetlands throughout the city.

FREQUENCY/DURATION

CUNY summer internship (8 weeks, FT work), a year-round CUNY internship which is 8 weeks FT in summer and 24 weeks PT in spring and fall, and a summer HS internship that is 6 weeks PT.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Interns must be enrolled in a CUNY school or be a recent graduate within 2 years for the college program related to the environment. The HS program is for rising juniors or seniors in the areas of Forest Park, Queens, or Staten Island Greenbelt. They must show interest in environmental work, but no experience is necessary.

APPLICATION PROCESS

The program recruits applicants from across the CUNY system who are majoring in biology, ecology, environmental studies, landscape architecture, and environmental engineering. There is a competitive interview process. The number of applicants has been increasing annually, and a typical year might see 80 to 100 applicants for 15 slots. For the HS program, it's an essay on their interest in studying the environment and a letter of recommendation from a teacher or counselor.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Interns are trained in data collection, urban ecological research, natural areas management, and nature-based solutions in the urban environment. Career readiness is also woven throughout the program.

OUTCOMES

80 percent of students get a full time job in the environmental field within six months of completing the program. Some have gone on to pursue advanced degrees in environmental fields. Many are now working at the New York State Parks Department or the U.S. Forest Service. Some have gotten jobs in local conservancies, including Natural Areas Conservancy.

90 percent of about 100 alumni are still in the tristate area.

KEY PARTNERSHIPS

New York City Parks Department

CUNY Office of Internships

Various local park conservancies

COST

The cost of a summer internship, depending on crew member or crew leaders, ranges from about $6,000-$8,000 per participant, including wages, benefits, custom curriculum and transportation. Hourly wage for interns who are crew members: $18.50. Hourly for interns who are crew leaders: $24. The cost to deliver the program is about $15,000 per participant.

SOURCES OF FUNDING

Private philanthropy (60 percent); New York State Department of Environmental Conservation (10 percent); and other nonprofits (30 percent).

WHAT MAKES THE PROGRAM STAND OUT?

The Natural Areas Conservancy set out to assess the health of New York City's 20,000 acres of forests, wetlands, and grass meadows in 2013, but found "a dearth of people qualified at a local level" to help, says Jaeger. The CUNY Internship Program was created to build a diverse local workforce who could contribute to research and management of natural areas. "The more science-based environmental positions in particular are historically very white," Jaeger says.

Interns are recruited from across the CUNY system for year-round paid positions. They begin in the summer, working in the field to hone their skills in plant identification, ecological surveying, and data management. They could be collecting data in wetlands and along shorelines to evaluate the health of natural features, building park trails to encourage public access, or working with communities to plan volunteer tree-planting events. "Our goal is to offer opportunities that touch every aspect of managing forests and wetlands across the city," says Jaeger.

Natural Areas Conservancy also created a custom curriculum for professional development and job readiness that includes weekly training in workplace communications, resume writing, personal brand development, personal finance, and interview skills.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

With baselined funding in the City's annual budget, the Parks Department could offer graduates better-paying career paths, rather than seasonal or grant-funded jobs. "The Parks Department is critically underfunded, especially the natural areas group, which is among least adequately funded within the agency," says Jaeger.

Less strict eligibility requirements for certain Parks Department positions, such as gardeners and foresters, would make these roles more accessible to diverse local candidates, she adds.

Interview with Elizabeth Jaeger, Deputy Director, Public Programs & Operations

31. Custom Collaborative

Custom Collaborative Training Institute is a sustainable fashion and entrepreneurship skills program for Black and brown women earning low or no incomes.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The program usually serves around 32 participants annually, or 9-12 participants per cohort.

DEMOGRAPHICS OF THE POPULATION SERVED

Participants are ambitious women living across the five boroughs and representing more than 20 nations. Nearly all Black and brown women, 85 percent are mothers, 80 percent live below the federal poverty level, and 50 percent live in unstable housing.

LOCATION OF THE PROGRAM

The program is held in the Garment District on 35th Street between 7th and 8th Avenues.

FREQUENCY/DURATION

The 15-week, 30-hour training program is offered two or three times per year.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be age 21 or older, able to attend full time, and vaccinated. No sewing or design experience is needed.

APPLICATION PROCESS

Applicants are assessed based on their level of interest in sustainable fashion, openness to challenge, and ability to work well with others.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

The curriculum was developed in house with support from fashion industry companies and experts in entrepreneurship and small business. It covers designing and sewing sustainable clothing and home goods using donated textiles, as well as entrepreneurship and personal finance. Participants receive a certificate from the program upon completion.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

Over 90 percent of training program graduates join the Business Incubator program, where they can access internships, apprenticeships, and jobs, start or expand their own business, or refine their business plan.

OUTCOMES

Graduates have gone on to enroll in GED programs and take ESOL courses. Three women are starting a new six-month apprenticeship program with the clothing company Theory later this month (an expanded version of CC's six-week pilot apprenticeship program with Mara Hoffman during the pandemic). Other graduates have done apprenticeships supported by the Chanel Foundation, internships supported by PVH Corp., or started their own businesses. One graduate was recently featured in a WNYC story about her line of custom upcycled jackets being sold at Art to Ware.

KEY PARTNERSHIPS

Various fashion companies, charitable foundations, Parsons School of Design at The New School, and The Fashion Institute of Technology (FIT).

COST

The per-participant cost of delivering the program is around $11,000. The program is free to participants. They receive a $200 per week stipend and receive free MetroCards.

SOURCES OF FUNDING

Most funding comes from foundations, with other funding from individuals, corporations, and $47,000 from the Department of Cultural Affairs ($47,000).

WHAT MAKES THE PROGRAM STAND OUT?

The City's fashion training programs are primarily offered by universities and for-profit companies, and the industry is "rife with unpaid internships," says Okaro. Custom Collaborative is creating space for low-income women of color and immigrant women to bring their perspectives and experiences to the sector. One participant from Angola "had never heard of sustainability before, but in her country, this is how everything is done. They're not wasting fabric. They're making quality clothes on demand that people will keep for a long time."

The organization aims to equip participants with the skills needed to become financially successful, while building community among current and former participants. The Training Institute welcomes women who lack any fashion design or sewing experience, and provides all equipment and materials, consisting of deadstock textiles that would otherwise go to landfills. Participants learn about sustainable fashion from industry experts, and the variety of career paths, from illustration to retail. Each participant designs and creates a garment for a classmate. They present their garment and share their creative process at a graduation fashion show. Training also includes 10 modules on entrepreneurship, including personal finance. Participants also create a business plan that centers sustainability.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

The program needs greater investment from the City to provide cutting-edge technology and equipment, as well as to cover the cost of childcare services for participants, and to support cooperative models beyond the initial investment, including funding for wraparound services like childcare.

Interview with Ngozi Okaro, Executive Director

32. Earth Matter NY: Zero Waste Island Internship

The Zero Waste Island Internship is a hands-on training program for adults in waste management, including composting and recycling, on Governors Island.

NUMBER OF PARTICIPANTS SERVED ANNUALLY

The program serves about 10 participants annually, and about 5 per cohort.

DEMOGRAPHICS OF THE POPULATION SERVED

The program serves New York City residents ages 18 and up, many from underserved communities. Some interns are graduates of the Hope Program's horticulture training program.

LOCATION OF THE PROGRAM

Governors Island

FREQUENCY/DURATION

The program runs from April through October. There are two back-to-back three-month cohorts. Participants work an average of 20 hours per week, or about 200 to 250 hours overall.

ELIGIBILITY CRITERIA FOR PARTICIPANTS

Participants must be 18 or older and committed to the program. There's flexibility if participants need more than three months to complete the 200 hours needed for their graduation certificate. Most interns are balancing the role with a part-time job.

APPLICATION PROCESS

There's an online application that opens in March.

CURRICULUM, INCLUDING ANY CERTIFICATIONS OR CREDENTIALS OBTAINED

Participants learn about zero waste management, including how to compost, the city's recycling rules, how to maintain and set up a zero waste system, waste audits, compostable plastics, and compost experiments.

JOB-SEARCH AND/OR PLACEMENT ASSISTANCE OFFERED, IF APPLICABLE

They'd like to do more job placement for interns, but they would need to grow the program, according to Executive Director Marisa DeDominicis.

OUTCOMES

Interns bring their knowledge back to their college campuses or their work as community gardeners. Some work for event planning companies that want to become more sustainable through composting. One former intern went on to become the Governors Island event coordinator for several years, and now runs high-end events for a private company.

KEY PARTNERSHIPS

The Hope Program, Trust for Governors Island, CUNY, RETI Center

COST

Interns receive a $500 stipend upon graduation. Free for participants.

SOURCES OF FUNDING

This year the program received $40,000 in discretionary funding from City Council, but it is not enough to pay four staff for three months. They receive some funding through the Zero Waste Island Initiative, charging for zero waste event management, consultations, trainings, and from hosting corporate team building events.

WHAT MAKES THE PROGRAM STAND OUT?

The Zero Waste Island Initiative is a partnership between the Trust for Governors Island and the non-profit organization Earth Matter aimed at reducing the amount of waste that leaves the island. Vendors and businesses on the island are required to use compostable serviceware (utensils) and collect food scraps. Earth Matter collects all of this organic waste and composts it for use in gardens around the island and throughout the city. Earth Matter also collects and separates vendors' recyclables. Interns help provide vendor staff training on sorting composting and recycling. They make weekly visits to ensure those systems are in place, and that vendors are separating organics and other waste products. Interns also teach the public about recycling and composting during open education hours.

Starting in September, Earth Matter is partnering with Baruch on a two-semester pilot internship program for engineering students focused on setting up and managing a reusable serviceware collective system. Governors Island wants to move from compostable serviceware to reusable, and with more funding, this program could eventually be incorporated into the Zero Waste Island Internship.

WHAT DOES THE ORGANIZATION NEED TO SUCCEED?

Earth Matter needs more funding to be able to pay interns more and to offer full-time work, so that interns don't need to work part-time jobs on the side.

In 2023, there were seven or eight events on the Island, and interns could get paid to be zero waste ambassadors, striking up conversations with visitors about composting and recycling. But in 2024, the only event was Jazz Age, limiting that funding stream.

DeDominicis would love to get more funding for the separate Youth Internship program, a 100-hour program in July-August for ages 15-18. Interns learn about farming, composting, and harvesting food, build composting systems and teach younger children about this work.

Recommendations

Recommendations

Realizing the Full Potential for Job Growth and Economic Mobility in NYC's Emerging Green Economy

1. STRENGTHEN AND EXPAND EFFORTS TO ENSURE THAT LOCAL LAW 97 SUCCEEDS. New York City's emerging green economy has enormous potential to spark sustained economic growth and create pathways into well-paying jobs for thousands of lower-income New Yorkers. But realizing this opportunity will only be possible with a major, sustained focus on ensuring that Local Law 97 succeeds in catalyzing emissions-reduction investments across the city's buildings sector. Today, that progress is far from assured, as building owners grapple with high borrowing costs, long payback periods, technical and logistical challenges, and a regulatory scheme in which the cost of compliance significantly outweighs the penalties.

To ensure that LL97's emissions-reduction targets are achieved via meaningful private sector investment in building decarbonization and electrification, policymakers should take several steps now to ensure future progress:

Establish a new NYC Green Building Fund. Accelerating the pace of building decarbonization will require expanded access to affordable capital that can be deployed to finance building retrofit projects. Many of the buildings that would benefit the most from major retrofits are also in difficult financial shape, with high vacancy rates and operating costs, and lenders have become increasingly risk averse. To help finance a much faster transition to lower-emissions buildings, New York City should work with the private sector to establish a new Green Building Fund—a revolving loan fund that will provide flexible, low-interest loans to buildings to finance decarbonization projects. Creative financing options could include loan repayment tied to new tax credits in the federal Inflation Reduction Act, helping buildings with their cash flow, as well as repayment plans pegged to the difference in energy usage before and after retrofits, with buildings repaying at least part of their loans with the savings.

Expand the PACE Financing program. The city should also expand the innovative but small-scale PACE Financing program, which helps connect eligible buildings to lenders who can help finance retrofit projects. The program works by offering long repayment periods—up to 25 years—which significantly lowers monthly costs. But to date, the program only includes 15 authorized lenders, just a handful of which are based in New York City, and generally does not cover projects under $500,000. The city should work with the state to expand this program, adding additional lenders including community development financial institutions with expertise partnering with smaller and lower-income building owners, and include more options for loans under $500,000 and over $5 million.

Harness existing incentives to help offset the cost of expensive upgrades. Alongside the creation of a new fund for building retrofits, city leaders should ensure that existing local tax incentives, including the city's Industrial & Commercial Abatement Program (ICAP), the New York City Industrial Development Agency (NYCIDA) programs, Manhattan Commercial Revitalization's (M-CORE) program, and the BUILD NYC program for tax-exempt organizations can all be tapped to help achieve LL97 compliance—uses that are not explicitly eligible today. At the state level, policymakers in Albany should amend and expand the J-51 tax abatement for renovating residential buildings, ensuring that the abatement can be applied to LL97 compliance projects.

Launch a Green Building Assistance Corps to bolster the effectiveness of NYC Accelerator. Shortly after the city passed LL97, it created the NYC Accelerator to provide personalized guidance to help building owners navigate the law's impact. Although this program has succeeded in connecting with thousands of buildings as an initial touch-point toward LL97 compliance, our research indicates that a much deeper level of hands-on guidance will be needed to help many more buildings make the investments needed to decarbonize—especially from 2030 onward. To prepare for future needs and get ahead of current capacity challenges, the city should enhance NYC Accelerator to keep pace with growing demand.

At the same time, much more technical assistance will be needed in the years ahead—including industry-specific expertise that the city's Accelerator program is not well equipped to provide. To meet this challenge, the city should launch a Green Building Assistance Corps, drawing from the city's deep well of private sector expertise, as well as the industry associations, trade groups, financial services firms, architecture and engineering companies, nonprofit green building organizations, community development organizations, and other potential partners who are best positioned to help deliver this assistance. Services could be offered at a sliding scale, with free, in-depth consultations provided to eligible buildings, as well as referrals to relevant state programs, such as NYSERDA's Multifamily Buildings Low-Carbon Pathways Program.

Revise LL97's penalty structure to align with compliance costs. While several actions are needed to help building owners invest in LL97 compliance, policymakers should also consider revisions to LL97's penalty structure, which currently provides little if any financial incentive to decarbonize. Many building owners say that under current conditions, they are likely to opt for paying the penalty instead of investing in costly retrofits. At the same time, the two-year extension of the "good faith" provision makes it even less likely that buildings will invest heavily in decarbonization before 2030. Lastly, buildings may be eligible to purchase renewable energy credits to offset as much as 100 percent of their emissions over the pre-LL97 baseline. To ensure that far more buildings actually make the decarbonization investments needed to reduce emissions and help spur the growth of green jobs, the city should consider adjustments to these mechanisms. The penalty rate—currently $268 per ton of carbon dioxide over their mandated limit—should be increased over time if compliance lags. Likewise, while RECs can provide an important source of funding for renewable energy development, future rules should limit their use to offset no more than 25 percent of a building's emissions over the baseline.

2. PREPARE NEW YORK CITY'S GRID FOR AN ELECTRIFIED FUTURE. New York has a massive opportunity in the decade ahead to reduce carbon emissions while sparking job creation by electrifying tens of thousands of buildings across the five boroughs and replacing hundreds of thousands of gas- and diesel-powered cars and trucks with electric vehicles. But this will only be possible if the city and state work together to bolster the city's electricity grid to meet growing demand and greatly increase the share of the city's electricity generated from renewable sources.

Accelerate the completion of key transmission and renewable power generation projects. Major gaps in energy production and transmission capacity are set to emerge as electricity demand in the city increases. The state's ability to meet New York City's future electricity demands hinges on the successful and timely completion of several ongoing transmission projects, including the Champlain Hudson Power Express, Clean Path NY, and Propel NY Energy, as well as major new offshore and onshore wind, hydro, geothermal, and solar power generation projects. To prepare the city for an increasingly electrified future, city and state policymakers should take action to enhance transmission capacity and reduce the time it takes to connect local renewable energy sources to the city's grid. State policymakers should enact the Renewable Action Through Project Interconnection and Deployment (RAPID) Act, which would create a one-stop-shop for the environmental review and permitting of major renewable energy and transmission facilities, and overhaul existing regulations that can add years to project timelines.

Work with Con Edison to strengthen NYC's energy grid and reduce interconnection delays. Within the five boroughs, significant new investments will be needed to bolster the capacity of the city's energy grid to accommodate future demand. Several areas of the city, including the northeast Bronx, southern Brooklyn, and southeastern Queens, are likely to reach or exceed grid capacity if major new electrification efforts succeed, shifting peak demand times from summer to both summer and winter. And although Con Edison boasts one of the most reliable grids in the nation, notching an impressive 99.99 percent uptime in 2022, the future work ahead is significant. The city and state should work closely with Con Edison to ensure that massive necessary grid upgrades and new substations are planned and completed in advance of 2030.[22] In addition, city leaders should work with the utility to accelerate the process for buildings that need to acquire service upgrades, a requirement that currently serves as a barrier for building owners that want to electrify their properties.

Introduce incentives to usher in more grid-interactive buildings. Emerging technologies can provide building owners with important new mechanisms for achieving decarbonization goals in the form of grid-interactive buildings—buildings that use advanced building control systems to optimize performance, reduce emissions, generate or release energy as needed from rooftop solar and in-building batteries, and lower operating costs. The city and state should introduce new incentives to promote these investments, helping to make the grid more efficient and resilient, while improving the performance of individual buildings.

3. UNLEASH GREEN TECH INNOVATION THROUGH CHALLENGE-BASED PROCUREMENT. New York City is home to a small but growing number of climate-tech, clean-tech, and other sustainability-focused start-ups, and this ecosystem is poised to grow significantly in the years ahead. One key opportunity to help unlock more growth potential among the city's green tech start-ups is by dramatically expanding the use of challenge-based procurement. Today, start-ups often struggle intensely to compete for city and state contracts. Big companies have several major advantages, including the ability to compete for contracts that may not lead to payment for a year or longer. In recent years, entities such as the Brooklyn Navy Yard, Downtown Brooklyn Partnership, and Governors Island have taken steps to encourage more start-ups to pilot their technologies in New York City. But much untapped opportunity remains for effective demonstrations of new green tech to grow into citywide deployments.

To achieve this, the city should dramatically expand challenge-based procurement for climate solutions—for everything from AI-powered building control systems to battery storage infrastructure that can replace street vendors' reliance on gas-powered generators. Despite the city's growing climate tech ecosystem, the city's current procurement process is nearly impossible for start-ups to access. A major expansion of challenge-based procurement—a competitive process in which successful pilot projects can grow into larger procurement contracts—can help start-ups bring their innovative products and services to scale. NYCEDC should work with other agencies including the Department of Citywide Administrative Services to launch new challenge-based procurement processes for a range of products and services that will help accelerate decarbonization efforts and ensure that more of the city's pioneering start-ups are able to test and grow their technologies in the public sector.

4. ACCELERATE THE PACE OF EV ADOPTION BY RAMPING UP EV INFRASTRUCTURE.

Rapidly deploy EV charging infrastructure and consider new incentives. Achieving the city's emissions-reduction and job-creation goals in the green economy will only be possible with a massive transition away from gas- and diesel-powered cars and trucks to electric vehicles and zero-emissions vehicles of all types. But progress has been slow, in part because of the high cost for consumers and in part because existing EV and zero-emissions transportation infrastructure—from charging stations to micromobility lanes to secure bike parking—remains far too limited or even nonexistent. NYCEDC's recent push to develop industrial-scale EV-charging hubs on city-owned property is a strong start, as is NYCDOT's proposed rule to expedite

approvals of private property owners installing chargers on public sidewalks. But to induce far more uptake for electric vehicles, including major commercial fleets like school buses and delivery trucks, the city will need to do more. Key steps should include designating thousands of city-owned sites for EV charging infrastructure—from lampposts to parking lots to curbside sites; launching challenge-based procurement with clear scale-up opportunities for successful pilots; identifying existing city tax incentives where rules changes or clarifications can make EV charging and micromobility infrastructure investments eligible; expanding rapid charging infrastructure that can support the energy needs of electric trucks; enforcing the implementation of Local Law 55, which requires new parking facilities to include charging stations; and developing new incentives to spur the introduction of charging stations in existing parking facilities. The state should also consider implementing new EV tax credits, in the event that the federal government reduces or eliminates the $7,500 credit on new purchases.

Invest in micromobility infrastructure to spur more widespread adoption and increase safety. The growing appeal of electric micromobility options like e-bikes and e-scooters also presents New York with a major opportunity to decarbonize transportation while boosting green jobs. But further adoption by both consumers and commercial fleets will be constrained without additional infrastructure investments. The Department of Transportation's recent authorization of e-cargo bikes and plan to install 500 secure bike storage with possible e-bike charging capabilities are important steps. Additional actions should include a state-level legalization of additional cargo e-vehicles (currently, state law restricts e-cargo bike widths to 36 inches or fewer, and motorized trailers are illegal). Policymakers should work with the Department of Transportation to create dedicated electric micromobility lanes and ramp up the expansion of bike lanes, which has slowed alarmingly in recent years. The city should also launch a network of secure bike parking stations that can double as e-bike charging hubs. Finally, the city will have to build on recent progress to help make e-bikes safer, including the launch and expansion of e-bike battery charging and exchange hubs and an expansion of voluntary battery trade-in programs.

5. EXPAND SOLAR POWER GENERATION BY TARGETING NEIGHBORHOODS AND SECTORS WITH THE MOST UNTAPPED OPPORTUNITY. New York has made significant progress incentivizing the deployment of solar power on city rooftops over the past few years, reaching a record 621 megawatts of power generation capabilities in 2024. At the same time, several parts of the city are lagging behind, including many lower-income communities, as well as most of the city's large commercial and industrial buildings. For instance, just 7 percent of the city's installed solar capacity is on large commercial or industrial buildings, and only 14 percent is located in the Bronx. Fortunately, the City of Yes for Carbon Neutrality plan addresses some of the key barriers to solar installation, such as overly restrictive rules around siting panels on rooftops and installing battery storage systems—rules that have largely inhibited the installation of solar on large multifamily and commercial buildings. However, to sustain this key sub-sector's impressive growth, city and state policymakers should do more to expand solar adoption by making solar power installation more affordable for lower-income buildings, targeting some incentives to large commercial and industrial buildings, and installing far more solar systems on city- and state-owned buildings.

Replicate the city's NYCHA community solar program across other city-owned buildings. The New York City Housing Authority (NYCHA) has made a significant commitment to incorporate 30 megawatts of solar energy on its properties by 2026 through the implementation of its community solar program, with as many as 30 major projects underway as of 2024. The mayor should allocate funding for other agencies and public entities—including the City University of New York and the city's three public library systems—to adopt similar solar programs and set a target of deploying 150 megawatts of solar power generation capacity on city-owned buildings by 2030. These investments can also help reduce energy costs and ultimately save the city some operating dollars.

Target state incentives to expand solar adoption in lower-income communities. The city and state have an important role to play in making solar more affordable—boosting uptake in areas where the pace of installation has lagged far behind, including across much of the Bronx. First, state policymakers should expand the residential solar tax credit by making it refundable for low-to-moderate income households and increase the maximum tax credit amount to $10,000 to adjust for inflation, and include energy storage. The state should work quickly to deploy funds from the federal Solar for All grant competition, which can help address the significant gap in uptake for rooftop solar among New York City's lower-income buildings, and allocate at least $125 million to overcoming the barriers to solar installation on multifamily and affordable housing, expanding community solar programs, and supporting workforce training in the solar industry.

Strengthen requirements around rooftop solar and green roofs. City government can also do more to strengthen existing mandates around solar. As currently designed, Local Laws 92 and 94—which require solar panels or green roofs on all new construction and buildings undertaking major roof renovations—include a broad range of exemptions, which have constrained the impact of these regulations. For instance, the law does not apply to rooftop structures and mechanical equipment, setbacks, terraces, and recreational spaces, among other uses. Policymakers should consider options for revising these exemptions or creating new protocols so that rooftops with these and other exempted uses still devote at least a portion of available space to solar and green roofs—such as a solar canopy above a terrace, or a green roof surrounding mechanical equipment.

6. LEVERAGE THE CITY'S ZERO WASTE GOALS TO SPARK ECONOMIC GROWTH. New York City has a long way to go to reduce the approximately 12,000 tons of waste generated daily, the majority of which ends up in landfills. Fortunately, taking steps to get New York City back on the path to achieving zero waste can help accelerate job creation in the green economy. The city should launch Reuse NYC, a major new five-borough effort to divert reusable materials from the waste stream and incentivize companies to switch from single-use products, building on the encouraging release of NYCEDC's Circular Construction Guidelines for capital projects. Key steps could include identifying a publicly owned site across the five boroughs where companies, start-ups, and nonprofits can develop sustainable waste management businesses with below-market-rate land leases; targeting existing tax incentives to include the infrastructure needed to facilitate reuse and recycling; implementing a disposal surcharge on waste, with the funds allocated to support waste reduction, reuse, and recycling projects; and passing legislation requiring producers and distributors of packaging materials to create and implement packaging reduction and recycling plans.

7. RAPIDLY BUILD THE INFRASTRUCTURE NEEDED TO SUPPORT THE OFFSHORE WIND INDUSTRY. New York stands poised to emerge as a national leader in offshore wind, with major production capacity coming to Long Island in the next two years. But even though the potential for significant job creation is evident, there's no guarantee that these jobs will be located within the five boroughs. That's because neighboring states have already developed the capacity to manufacture, assemble, install, maintain, and service offshore equipment—including for New York's inaugural offshore wind farm, South Fork, which was assembled and installed from ports in Rhode Island and Connecticut. Encouragingly, city and state policymakers are proactively addressing this challenge. NYCEDC has invested $191 million in converting existing marine facilities, such as the South Brooklyn Marine Terminal, into an offshore wind port. Likewise, Empire State Development recently granted $48 million to convert the Arthur Kill Terminal on Staten Island. But city policymakers can't afford to take their eyes off the prize: the swift implementation of these initiatives will be essential for positioning New York City as a front-runner in the rapidly expanding offshore wind industry and encouraging the development of an onshore ecosystem of businesses that can grow alongside the sector even as timelines are suddenly unclear, following the Trump administration's order to halt wind farm permitting. At the same time, the city should identify opportunities where turbine manufacturing, the most labor-intensive part of the industry, could be done within the five boroughs, and take steps to encourage the growth of offshore wind-related manufacturing jobs.

Recommendations

Expanding Access to Job Opportunities in NYC's Emerging Green Economy

New York City's emerging green economy is poised to become one of the key drivers of job growth over the next decade and beyond, and presents arguably the greatest opportunity in years to expand access to well-paying career opportunities for New Yorkers from low-income backgrounds. But while New York City is home to dozens of innovative workforce training programs—often the first of their kind—that prepare unemployed and underemployed New Yorkers for a range of green-economy jobs, much more work will be needed to align these programs with the evolving needs of an emerging sector.

To its credit, the Adams administration has made some important initial steps toward realizing this opportunity, including several key commitments in the 2024 Green Economy Action Plan. Implementing those proposals—including the creation of green economy training facilities in each borough by 2030 and the expansion of green economy industry partnerships—will be vital to achieving the goal of ensuring equitable access to green economy careers. At the same time, more will have to be done. This report includes nine additional recommendations for growing and strengthening the workforce development and training ecosystem aligned with emerging green careers.

1. LAUNCH A GREEN ECONOMY DATA DASHBOARD AT NYCEDC TO INFORM WORKFORCE PROGRAM DESIGN AND INVESTMENT. To maximize the effectiveness of public and private sector investments in workforce development programs aligned with the emerging green economy, funders and providers alike will need access to accurate data on employment trends in green-related industries and occupations. But this poses a major challenge today. Neither the federal Bureau of Labor Statistics nor the state Department of Labor publishes data on green economy jobs, which makes it difficult for funders or providers to calibrate their programs to meet real-world labor market needs. Fortunately, the city's Economic Development Corporation has undertaken and published an extensive analysis of projected job growth in the city's green economy, which offers a broad view of anticipated trends. But to inform effective new workforce investments going forward, NYCEDC should develop and maintain a comprehensive green economy data dashboard—leveraging the Green Economy Action Plan's methodology to provide a quarterly window into job growth and skills demand trends across the city's emerging green sectors, or launching a challenge-based procurement for a new cutting-edge green economy labor market analytics tool. This data dashboard should be developed in partnership with the city's Workforce Development Council and eventually enhanced with data on education and training capacity aligned with key green economy industries and occupations, enabling city policymakers, training providers, and philanthropic foundations to gain a much clearer picture of the access challenges and opportunities in the emerging green economy.

2. LAUNCH A FIRST-OF-ITS-KIND INITIATIVE TO TAP CUNY'S STUDENTS TO BUILD A GREENER UNIVERSITY —PREPARING THEM FOR GREEN ECONOMY CAREERS. To prepare thousands of mostly low-income, first-generation college students for the green economy jobs that are coming online now and in the years ahead—and help spark the economic growth needed to bring these jobs to fruition—the city should make a major new capital investment in greening CUNY nearly 300 aging buildings, and launch a first-of-its-kind effort to tap CUNY's students to achieve this. This effort could provide immensely valuable hands-on experience for thousands of

CUNY students in areas from architecture, engineering, and materials science, to finance and capital planning, to the building trades, while helping to reduce emissions from a key part of the city's portfolio. This effort could take advantage of an unprecedented opportunity to harness federal and state funding for building decarbonization efforts, while leveraging the many assets already in place at CUNY and coordinating several existing city, state, and philanthropic investments—from CUNY's Inclusive Economy Initiative to the state's approval of tuition assistance for workforce training. In a promising start, SUNY and CUNY will receive $150 million from the state's Clean Water, Clean Air, and Green Jobs Bond Act to support decarbonization efforts across campuses, but more is needed. Today, CUNY educates a growing number of students earning degrees and certifications in everything from clean energy HVAC and solar power to architecture and engineering to sustainability in the urban environment and offshore wind. At the same time, CUNY is home to the innovative Building Performance Lab, which has hands-on experience in building decarbonization strategies and materials. City College's Grove School of Engineering already operates cutting-edge renewable energy and building electrification research centers, and the Sustainable CUNY initiative has seeded hundreds of smart campus sustainability actions. This new initiative can succeed in putting CUNY students on the path to green economy careers, while transforming the nation's most powerful economic mobility institution into its greenest one, too

3. DEPLOY AN ELECTRIFICATION CAREERS CHALLENGE GRANT TO SCALE UP TRAINING PROGRAMS FOR HVAC TECHNICIANS AND ELECTRICIANS—TWO KEY OCCUPATIONS IN THE GREEN ECONOMY WHERE DEMAND IS ALREADY EXCEEDING SUPPLY. Although much anticipated hiring demand is yet to materialize as the city's green economy gets on its feet, two key green-enabling occupations are already experiencing a surge of demand: HVAC technicians and electricians. As of 2023, New York City was home to 25,121 HVAC installers and electricians—and 28,348 jobs in these occupations. With 23 percent of this workforce currently ages 55-plus, this undersupply of talent is poised to grow. To address this gap and help expand access to these careers for New Yorkers from disadvantaged communities, the Adams administration should launch an Electrification Careers Challenge Grant—leveraging federal, state, and private sector funding—to help scale up existing workforce training programs aligned with these two key occupations, including union-linked pre-apprenticeships, apprenticeships, and direct-entry programs.

4. CREATE A PAY IT FORWARD PROGRAM FOR GREEN ECONOMY TRAINING PROGRAMS THAT DELIVER ON EMPLOYMENT OUTCOMES. Today, most of New York City's green workforce training programs are small in scale and heavily reliant on short-term public and philanthropic funding. Among the 42 unique green economy training programs profiled in this report, their total training capacity is only around 7,900 New Yorkers per year, and 17 programs serve fewer than 100 people annually. To help build the capacity of these programs and develop new ones aligned with emerging career opportunities, city leaders will need to identify sustainable funding streams that can support effective career training programs. To do so, the Adams administration should create a Pay It Forward program for green economy training programs that work, seeded with dollars from both the public and private sectors. Following the lead of the State of New Jersey, this program would offset the cost of tuition for effective training programs that consistently deliver strong employment outcomes, with graduates repaying the cost of tuition back into the fund—but only if they land a well-paying job after completing the program. This mechanism could provide a reliable source of ongoing funding for programs that prove to be effective, while incentivizing both government and providers to focus on programs that deliver results for their participants.

5. BUILD GREEN JOBS CAREER PATHWAYS INTO THE CITY'S MAJOR APPRENTICESHIP DEVELOPMENT EFFORT. New York City is taking decisive steps to expand apprenticeship pathways into well-paying careers, working toward a major goal of connecting 30,000 New Yorkers to apprenticeships by 2030. To that end, the city has launched the NYC Apprenticeship Accelerator—an idea initially proposed by the Center for an Urban Future in a 2021 report—and, most recently, issued a new request for proposals for organizations interested in developing

new apprenticeship programs. Importantly, the city's Green Economy Action Plan includes a commitment to deliver 12,000 green economy apprenticeships by 2040. To get there, city and state leaders, unions, and the private sector will have to make new investments in launching and expanding apprenticeship programs aligned with green careers. Governor Hochul and the State Legislature should boost support for the city's vital effort, with new funding for apprenticeship intermediaries, unions, CUNY, and industry partners to cover program design and start-up costs and create playbooks for supervisors and trainers, and an effort to streamline the process for registering new apprenticeship programs with the state Department of Labor, so that employer partners are able to access existing tax credits. The city should invest in boosting the capacity of the NYC Apprenticeship Accelerator, with a decided staff member overseeing green economy apprenticeship development and launch new RFPs for pre-apprenticeship programs and onramps in the building trades, renewable energy, electric vehicle infrastructure, and sustainable waste management, so that community-based organizations can receive funding to help residents with barriers to training and employment connect with existing and new apprenticeship programs that might otherwise be out of reach. At the same time, the city's building trades unions should commit to expanding the number of new hires made through pre-apprenticeship pathways, and partner with the NYC Apprenticeship Accelerator to build pathways into the occupations with the greatest number of projected openings in the years ahead, like electricians and HVAC technicians, as a growing number of members reach retirement age.

6. BUILD A CLIMATE TECH FELLOWSHIP PROGRAM TO HELP DIVERSIFY TALENT PATHWAYS INTO EARLY-STAGE GREEN TECH START-UPS. One small but highly promising area within the city's emerging green economy is the cluster of start-ups focused on climate change, green tech, clean tech, climate finance, and other technology-powered products and services aimed at accelerating the transition toward carbon neutrality. Jobs in these start-ups are poised to grow significantly, as venture capital and institutional investment flows into this sector. Importantly, these early-stage jobs also function as key drivers of wealth creation, as employees gain equity in their companies. Many of these early employees will go on to be the funders and founders of the future. To help expand access to employment opportunities in the city's green tech ecosystem, new investments will be needed in developing career pathways into green economy start-ups. The city should create a new Climate Tech Fellowship Program—potentially in partnership with Tech:NYC, the city's Tech Talent Pipeline, and CUNY—aimed at cultivating the next generation of underrepresented tech talent interested in solving climate-related challenges. The Fellowship would provide participants with access to mentors in the industry, networking opportunities, professional development, and paid internship experiences with start-ups and other firms working on climate tech innovation, with the goal of ensuring that more New Yorkers of color are able to get in on the ground floor of the city's growth-stage green economy start-ups.

7. LAUNCH NYC'S FIRST GREEN ECONOMY OPPORTUNITY FAIR FOR MIDDLE- AND HIGH SCHOOL STUDENTS Many of the students in New York City's middle- and high schools today are eager to seek out opportunities in the green economy after graduating, but many more simply do not know where to start. In order to expand access to green economy careers, more should be done to boost green career exploration opportunities in the city's public schools and raise awareness of the postsecondary pathways that exist for a range of green careers. To help address this challenge, the Adams administration should work with New York City Public Schools to launch the city's first annual NYC Green Economy Opportunity Fair, modeled on the highly successful NYC Computer Science Opportunity Fair (CS Fair), which has grown to become the city's largest annual college and career inspiration event for public high school students. Like the CS Fair, the Green Economy Opportunity Fair would bring together CUNY and other colleges, postsecondary training providers, and employers for a major showcase of the career opportunities and education and training programs that exist in the city's green economy, with the goal of inspiring more young people from low-income communities to pursue pathways into green careers.

8. CREATE A GREEN ECONOMY RESKILLING COUNCIL TO HELP DEVELOP AND EXPAND TRAINING IN GREEN SKILLS FOR INCUMBENT WORKERS. Although the growth of the green economy is poised to create thousands of new jobs, a large portion of the city's current and future green careers will be an adaptation of existing jobs. The Adams administration's Green Economy Action Plan projects that of the estimated 250,000 jobs added to the city's green economy by 2040, 175,000 will be current jobs that will become sustainability-focused, whereas only 75,000 will be entirely new jobs. Ensuring equitable access to these transitioning jobs will require a major expansion of reskilling programs for current workers—an area in which New York City has made relatively little investment in recent years. To change this, the city should launch a Green Economy Reskilling Council—a public-private partnership comprising members of the city's Workforce Development Council and Board, Green Advisory Council, LL97 Mobilization Council, and NYC Talent's Industry Partnerships—as well as leading training providers, unions, other trade associations, and CUNY. The Council would advise the city and partner organizations on reskilling needs across occupations and industries within the broader green economy and lay the groundwork for a major new investment in reskilling programs between now and 2030.

9. INTEGRATE WRAPAROUND SERVICES INTO WORKFORCE DEVELOPMENT CONTRACTS. In addition to growing the city's workforce training ecosystem for green careers, city leaders should prioritize new investments in wraparound services and other key supports like wage subsidies that can make programs more inclusive and effective. Several organizations interviewed for this report cited a lack of funding for these supports—including stipends and wage subsidies, OMNY cards, and childcare—as a major barrier to participation for the New Yorkers who would otherwise benefit the most. In addition, programs that are able to offer these supports generally demonstrate better persistence, completion, and post-completion outcomes, suggesting that relatively modest investments in wraparound services can generate a stronger return on investment for public training dollars. The problem is that while some philanthropic foundations provide grants that can be used for these purposes, city workforce contracts generally do not—and federal funding comes with tight restrictions on these uses. To overcome these obstacles, the city should incorporate flexible city tax levy funding specifically for wraparound services in future RFPs, help workforce providers build capacity to screen participants for benefits eligibility, and pilot new workforce funding designed to test and assess the effectiveness of specific supports on program outcomes.

Endnotes

1. Center for an Urban Future analysis of job postings data from Lightcast. Lightcast defines the Green Skills category as including the following skills: Certified Energy Manager, Marine Conservation, Environment Management, Thermal Modeling, NABCEP Certified Energy Practitioner, Conservation Biology, Wildlife Conservation, Conservation Planning, Climate Variability And Change, Conservation Science, Ecological Restoration, Energy Supply, Geographic Information Systems, Air Quality, Battery Pack, Biological Hazards, Biomass, Built Environment, Certified Hazardous Materials Manager, Corporate Sustainability, Recycling, Water Wells, Energy Demand Management, Development Management, Ecology, High Voltage, Occupational Safety And Health, Energy Conservation, Energy Technology, Environmental Engineering, Environmental Health, Environmental Laws, Environmentalism, Environmental Impact Assessments, Environmental Auditing, Environmental Chemistry, Environmental Compliance, Environmental Consulting, Environmental Design, Environmental Economics, Environmental Education, Environmental Issue, Environmental Resource Management, Environmental Management Systems, Environmental Mitigation, Environmental Monitoring, Environmental Planning, Environmental Reporting, Environmental Science, Environmental Studies, Environmental Tests, Environmental Toxicology, Pollution Prevention, Field Surveys, Forestry, Geochemistry, Geography, Geology, Geotechnical Engineering, Earth Science, Geotechnical Investigation, Greenhouse Gas, Green Building, Renewable Energy, Grid Connections, Groundwater, Hydrogeology, Hydrology, Turbines, Occupational Hygiene, Waste Management, ISO 14000 Series, Land Management, Land Use, Land Tenure, Liquefied Petroleum Gas, Materials Recovery Facility, Wastewater, OHSAS 18001 Standard, Passive Solar Building Design, Photovoltaic Systems, Planning Permission, Water Pumps, Waste Collection, Safety Culture, Sewage Treatments, Sediment, Soil Science, Solar Energy, Solar Systems, Surface Water, Sustainable Design, Sustainable Development, Toxicology, Water Resource Management, Water Quality, Water Services, Water Treatment, Wind Farming, Wind Turbines, Zoology, Hazardous Waste Operations And Emergency Response Standard (HAZWOPER), Environment Health And Safety, Energy Policy, Transfer Station, Water Consumption, Wind Power
2. USGBC, accessed on December 14, 2023; online at https://www.usgbc.org/projects?Country=%5B%22United+States%22%5D&Certification=%5B%22Platinum%22%2C%22Gold%22%2C%22Silver%22%2C%22Certified%22%5D&SearchResultsortOption=%22Featured+Projects%22&State=%5B%22New+York%22%5D&RegStartDate=%222000-01-01%22&RegEndDate=%222023-12-14%22.
3. The New York Times, Why the New York Area Is Seeing an Explosive Growth in Electric Cars, https://www.nytimes.com/2023/03/05/nyregion/electric-vehicles-cars-nyc.html#:~:text=In%202020%2C%20there%20were%20about,Public%20Policy%2C%20a%20research%20firm
4. Center for an Urban Future analysis of Lightcast Data.
5. Blackstone, "2022 Report: Climate-related Financial Disclosures." https://www.blackstone.com/wp-content/uploads/sites/2/2023/09/2023_TCFD_Report_Blackstone.pdf.
6. Center for an Urban Future analysis of New York Department of Labor statistics (March 2020 – November 2023).
7. Center for an Urban Future analysis of electrical permit applications data from New York City Department of Buildings.
8. In New York City, buildings are classified as Class A, B, and C to categorize the quality, amenities, and conditions of residential properties. Class A buildings are considered the highest-quality buildings in terms of construction, amenities, location and have the highest rents. They are often newer constructions or extensively renovated older buildings. Class B buildings typically appeal to middle-income tenants looking for a balance between quality and affordability. Class C buildings are often older, may not have been recently renovated and are less centrally located.
9. Center for an Urban Future analysis of New York Department of Labor statistics (March 2020 – November 2023)
10. New York ISO, "2023 Power Trends: A Balanced Approach to a Clean and Reliable Grid," https://www.nyiso.com/documents/20142/2223020/2023-Power-Trends.pdf/7f7111e6-8883-7b10-f313-d11418f12fbf?t=1686132123808.

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