Elevating local ecosystems through inclusive workforce pathways

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ABSTRACT

New York's clean energy economy continues to drive job growth as the local lawmakers take an aggressive stance in fighting climate change. New York (NYS) has taken a stand through the State's Climate Leadership and Community Protection Act (CLCPA)[3], and New York City's Climate Mobilization Act (CMA). Historically, prosperity in New York City (NYC) is not shared equitably[4]. Low-income[5] New Yorkers and Black, Indigenous, People of Color (BIPOC) are often the first to experience economic disinvestment, climate disasters, and environmental degradation while being the ones who are least likely to cause them (Islam and Winkel 2018). NYC was particularly hard hit by the COVID-19 pandemic, which has exacerbated existing racial and class disparities. The CLCPA and CMA incorporated policies to support frontline communities[6] first. This paper explores programming from NYC Mayor's Office of Sustainability, Green City Force, and Kinetic Communities Consulting developed to adapt the existing clean energy sector[7] workforce development ecosystem to support new strategies for communities facing systemic[8] barriers to economic development.

[1] Opinions expressed here are those of the author and not those of the New York City Mayor's Office.

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[3] The CLCPA defines disadvantaged communities as "communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high-concentrations of low- and moderate- income households".

[4] Equity is the condition that would be achieved if one's racial identity or other protected class no longer predicted, in a statistical sense, how one fares. When we use the term, we are thinking about racial equity as one part of racial justice, and thus we also include work to address root causes of inequities not just their manifestation. This includes elimination of policies, practices, attitudes, and cultural messages that reinforce differential outcomes by race or fail to eliminate them. (FPG's Race, Culture, and Ethnicity Committee 2017)

[5] 60% at or below State Median Income (family of four making $64,020 per year, or family of one making $44,820 per year) (NYC HPD 2019)

[6] Frontline communities are those that experience "first and worst" the consequences of climate change. These are communities of color and low-income, whose neighborhoods often lack basic infrastructure to support them and who will be increasingly vulnerable as our climate deteriorates. These are Native communities, whose resources have been exploited, and laborers whose daily work or living environments are polluted or toxic.

[7] Clean energy sector is defined as clean energy generation and energy efficiency.

[8] Systemic barriers are policies, practices, or procedures that result intentionally excluding people from receiving access or being a part of something.

Introduction

The Existing State of Economics and Workforce

In 2019, NYC residents owned a total wealth of $469.7 billion, making it the wealthiest city in the world (Coudriet 2019). When people talk about NYC's labor market, the assumption is that it is always thriving. In January 2020, NYS's unemployment rate was a record low of 4.0% since 1976, and NYC at 3.2% (NYS DOL 2020). When examined carefully, Black, Latinx, and disabled New Yorkers have higher unemployment rates (12.4%, 10.4%, and 17.7%, respectively) than the NYC average from 1992 to 2019 (8.6%) (NYC HPD 2020). When COVID-19 began, 29% of New Yorkers reported they or someone in their household lost their job. Approximately 4 in every 10 Latinx became jobless in March 2020 (CUNY Graduate School of Public Health and Health Policy 2020). As COVID-19 stay-at-home orders lifted in May of 2020, national employment rates slowly bounced back, but not for Black adults, whose unemployment rates continued to increase (Burns 2020). There are many New Yorkers who are working and are chronically under-employed and struggle to keep up with some of the highest costs of living in the country. In 2019, even before the COVID-19 outbreak:

- 44% of New Yorker's were rent-burdened (paying more than 30% of their income),
    - 50% of those households were severely rent-burdened, paying 50% of their income towards rent
- 90% of those households were low-income New Yorkers
    - Of those households, 50% were Asians/Pacific Islanders, 44% were Latinx, and 37% were Black [9]

This dataset does not take into consideration the population residing in publicly supported housing[10], whose residents are over 60% Latinx and Black (NYC HPD 2020). The Bronx housed the highest number of income burdened residents and was also home to many of the neighborhoods that were most impacted by COVID-19 (Freytas-Tamura, Hu and Cook 2020). In January 2020, The Bronx is the 32nd poorest county nationwide, with a family's median income equaling $38,085 (USA Today 2020). NYC looks prosperous according to macro-level data, but NYC has a substantial equity problem. NYC's equity problem stems from systemic racist policies that hindered housing, economic development, and climate resilience.

Youth, Workforce, and COVID-19

COVID-19 pandemic exacerbated the health and economic well-being of New Yorkers, specifically, BIPOC young adults. Before COVID-19, the statewide young adult unemployment rate— which measures those without a job but who are actively looking for work—was 20.7% for 16- to 19-year-olds and 11.6% for 20- to 24-year-olds. One-third of 18- to 24-year-olds lost their jobs, which is higher than the city's overall job-loss rate of 26%. In NYC specifically, 16% of both 18- to 24-year-olds and 25- to 30-year-olds were out of school and out of work. Youth

[9] The NYC population is 14% Asian/Pacific Islander, 29% Hispanic and 24% black or African American according to U.S. Census. Therefore, each of these groups is disproportionately low-income (US Census 2019).

[10] Residents of NYC public housing pay 30% of the household's adjusted gross income as rent or a flat rent, whichever is lower.

were having difficulty staying connected to the economy even before the spike in unemployment brought on by the pandemic (JobsFirstNYC 2020).

This was a troubling trend since we know that early work experience increases earning potential and better prepares young adults to enter an increasingly competitive labor market. To add another constraint, in the fight against the pandemic, the government issued austerity budgets. $57,500,000 was removed from the budget allocated for NYC Summer Youth Employment Programs (Nu Origins 2020). These programs are critical to helping young adults obtain capacity building support and experience needed to compete in the market. Organizations that support young adult programming, explicitly programming for frontline communities such as out-of-school and out-of-work young adults have been hard hit, which has impacted their bottom line, ability to secure funding and personnel, and deliver services as a result of the pandemic.

JobsFirstNYC, a local nonprofit, conducted surveys and interviews to learn about the impact of COVID-19 on the young adult workforce development. The report highlighted the following ramifications of the pandemic:

- Household finances declined as COVID-19 exacerbated preexisting inequalities in the areas of food, housing, health, and financial insecurity
- Having a job became a matter of life and death, not just employment. The pandemic caused young adults to face greater competition for jobs, internships, and work-based learning experiences
- Young adults and nonprofit staff who work with BIPOC populations faced rising mental and physical health needs
- The transition to remote teaching and learning did not meet all of the needs of young adults and negatively affected their skills training and educational progress
- The future of the labor market was uncertain, leaving workforce providers and jobseekers without a roadmap

A recession can have consequences for young adults. Young adults today have acquired more student loans than previous generations. The loans impact their wealth generation and have intergenerational consequences for their children—who are more likely to suffer from poor health, targeted to be imprisoned, and rely on a social safety net.

Background

Systemic Challenges

Systemic challenges of housing, education, income, and environmental injustices are not separate issues. Injustices stem from policies and practices that have left low-income and Black, Indigenous, and People of Color (BIPOC) communities behind. The paradigm between workforce development and social justice stems from NYC's history with redlining[11] in the

[11] Redlining is the practice of denying a creditworthy applicant a loan for housing in a certain neighborhood even though the applicant may otherwise be eligible for the loan. The term refers to the presumed practice of mortgage

1930s. In 1933, the federal government established the Homeowners Loan Corporation (HOLC) to refinance mortgages and provide low-interest loans to address suffering during the Great Depression (US DOT 2006). The government established the Federal Housing Administration (FHA) the next year to guarantee home loan mortgages. Both agencies adopted the practice of redlining in the administration of their loans, developing uniform appraisal standards that deemed integrated and predominately non-white areas too risky for investment (Masset 1990). These regulatory practices, in turn, influenced and legitimated redlining in the private lending industry. Government officials circulated redlined maps to private lenders (Mahoney 1995).

Lenders utilized redlining to subsidize homeownership opportunities for white households[12], white communities, and the suburbs, while strictly excluding prospective borrowers in BIPOC communities and mixed-race communities (Masset 1990). They assigned grades to neighborhoods that were used to determine how desirable they were for funding opportunities. Neighborhoods with the most significant opportunity obtain an A, and those with the least earned a D. Figure 1. Shows D4 area (red shading on the map) in The Bronx as a "Hazardous Area" for investment due to the "detrimental influences of Negro and Porto Rican infiltration." This area received a D-, which denied these communities access to the primary source of intergenerational wealth and stability in the 20th century, homeownership (Desmond 2017).

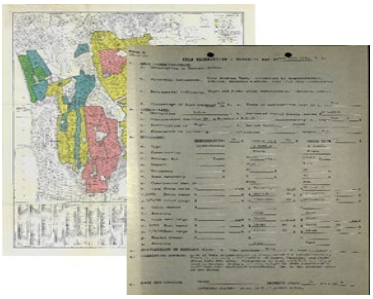


Figure 1 Redlining map and area characteristics Source: Nelson n.d.

Urban Renewal[13] policies and denial of G.I. Bill housing and education benefits to BIPOC have historically disenfranchised many urban communities, creating a lasting effect on intergenerational economic and career growth (Katznelson 2006). These policies actively and intentionally exacerbate the wealth gap between BIPOC and White Americans.

lenders of drawing red lines around portions of a map to indicate areas or neighborhoods in which they do not want to make loans based off race (Board of Governors of the Federal Reserve System 2006).

[12] Protestant and non-immigrant whites were used as the highest recognition for redlining (non-Italians, non-Jewish, non-Polish, and non-Irish)

[13] Urban Renewal: three policies enacted in the postwar era, the Housing Act of 1949, the Housing Act of 1954, and the Federal-Aid Highway Act of 1956. Up until 1974, the federal government funded a nationwide policy of demolition and large-scale clearance. Highways made suburban housing available on one end while destroying urban housing on the other. These policies arranged racially isolated urban and suburban communities, also known as white flight. (Powell 2012)

Housing and the Economy

Economic hardship during the Great Recession in 2009 reinforced the divide. The country faced a housing and credit crisis that disproportionately affected African Americans and Latinxs (US HUD 2007). In early analysis of the impacts of the COVID-19 crisis on housing, African American and Latinx households are disproportionately impacted by inability to pay rent and mortgages, which many believe will lead to a racialized foreclosure and eviction crisis (Greene and McCargo 2020). These communities have been undercapitalized since World War II when redlining was in full bloom. With little residential or commercial lending from mainstream banking institutions, isolated BIPOC communities were indeed easy prey for high-cost credit institutions that faced little competition (Powell 2012). These communities remain largely invisible other than being criticized for taking out loans (Powell 2012). NYC experienced an unbalanced economic recovery after the Great Recession in 2009, which accelerated the structural weakness in the labor market. Since 2009, one million working New Yorkers, who comprise a quarter of the total labor workforce, earn less than $20,000 per year. The average income of the top 1% in NYS in 2018 was $2.2 million, while the average income of the bottom 99 % was $49,617 — a ratio of 44.4 to 1(Sommeiller and Price 2018). As the COVID-19 crisis unfolds, this gap is widening even further with African American and Latinx more likely to lose income as a result of the crisis than white Americans (Maxwell 2020). Since late March almost two-thirds of jobs lost due to the pandemic were held by workers earning less than $40,000 a year (The New School 2020). New Yorkers are struggling with stagnant wages and subpar work conditions. Many workers have not had an opportunity to obtain industry requested qualifications to advance to middle-class jobs, constraining New Yorkers to stay in low-income and precarious jobs.

The U.S. Housing and Urban Development (HUD) developed a "Labor Market Engagement Index" to understand residents' proximity to job opportunities. The higher the number, the stronger the rates of employment, labor force participation, and educational attainment are in the neighborhood. Figure 2. shows that areas of NYC rank both among the highest and the lowest nationally on the Labor Market Engagement Index.

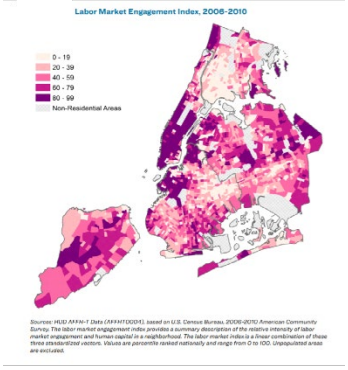


Figure 2 Labor Market Engagement created by HUD to understand the relationship between high and low rates of employment, labor force participation, and educational attainment in each neighborhood. Source: NYC HPD, 2020.

In HPD's pre-COVID-19 analysis, large parts of the Bronx—whose residents are predominantly Black and Latinx—score very low on the index, while much of core Manhattan, — whose residents are majority White and Asian—score very highly on the index (NYC HPD

2020). Overlaying redlining maps with the Labor Market Engagement Index map illustrates identical geographical regions affected by redlining are also those who have the lowest labor market. Through redlining policies, the federal government intentionally informed banks to disinvest in certain communities, not only diminishing home ownership opportunities, but local economic development which decimated the job market.

Workforce and Climate Change

Relationship of Housing, the Economy, and Climate Change

Building solutions that disrupt a pattern of pollution and environmental degradation can help the city address inequity. Many of the city's redlined areas are now the highest impacted by the effects of climate change and COVID-19. Figure 3. Displays a heat vulnerability score, which is a measure of a neighborhood's extreme heat compared risk with other neighborhoods.

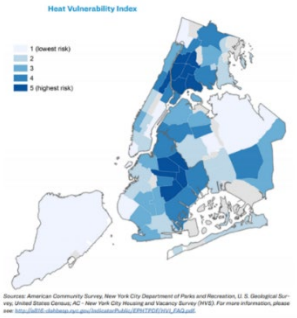


Figure 3 Measure of how at-risk a neighborhood is during extreme heat compared with other neighborhoods. Source: NYC HPD 2020

In addition to heat vulnerability, environmental, and economic factors compounded in a way that these same redlined, heat-vulnerable communities were also most impacted by COVID-19. Poor indoor and outdoor air quality, more cramped living conditions, and higher likelihood of working in low-income service jobs that were deemed "essential," among other factors, have been linked to higher likelihood to contract COVID-19, and a higher likelihood of having worse health outcomes.

Figure 4. Impacts of COVID a) cases per 100,000 by zip code; b) death rate by income; c) death rate by Race/Ethnicity. Source (NYC Department of Health 2020).

The same area in The Bronx affected by redlining and limited labor market engagement opportunities is also most vulnerable to heat and COVID-19. The residents in that area are primarily low-income BIPOC communities. These neighborhoods usually have a high percentage of impervious surfaces and dense human activity contributing to heat vulnerability and poor air quality. High levels of impervious surfaces can lead to temperatures of up to 22°F hotter in the neighborhood than rural and suburban areas as part of a phenomenon known as the Urban Heat Island Effect (UHIE)[14]. Periods of extreme heat have a profound effect on human health, including dehydration, heat exhaustion, heat-stroke, and mortality. In NYC, specifically, extreme heat is the number one cause of death from severe weather (ORR 2016)**.** Climate Change exacerbates the threat of extreme heat. The NYC Panel on Climate Change projects up to a 5.7°F increase in average temperatures and a doubling of the number of days above 90°F by the 2050s. Low-income BIPOC communities tend to have less tree cover and more roads, highways and polluting industries, resulting in poor outdoor air quality. The underinvestment in the housing stock results in worse indoor air quality as well. Both factors have led to increases in asthma and heart disease, both of which are linked to worse COVID-19 outcomes (Frazin 2020). Not only were many in these communities more likely to contract COVID-19 as a result of being deemed an "essential worker", but they were more likely to be hospitalized or die from COVID-19 due to underlying environmental factors.

The Value of Climate Change Solutions to the NYC Workforce Ecosystem

From 1990-2010, the NYC workforce system focused almost exclusively on job placement with a limited strategic focus on high-value economic sectors or consideration for job quality and career advancement. Due to disinvestment, many government agencies, and local nonprofits (many who were created by residents to support upward mobility) were reactive to N.Y. issues. These organizations were often siloed and focused on the number of people connected to jobs and not the quality or longevity of the work to bring low-income New Yorkers into the middle class. Program participants may have been connected to a job, but there was little tracking or emphasis on the quality of jobs, job retention year over year, or whether there were continued opportunities for career advancement (NYC Mayor's Office of Housing & Economic Development n.d.).

In the past decade, NYC acknowledged the deficiencies in a workforce system that was primarily driven by job placement numbers. In 2014, NYC outlined three core strategies to create a more holistic model: 1. Building Skills Employers are Seeking 2. Improving Job Quality 3. Increasing System and Policy Coordination (HED 2015). New initiatives would engage employers in curriculum development and workforce programming to ensure that trainees meet employer's demands. It also focused on not only placing as many people as possible in jobs but providing that those jobs created a pathway towards economic mobility. Increasing coordination between various actors to ensure that individuals have support through every step of their careers is a critical foundation for a complex workforce system. It became clear that workforce

[14] UHI effect leads to higher air pollution, and greenhouse gas (GHG) emissions (US EPA n.d.).

development should not just focus on diversity, which is about numbers, to inclusion, which is about holistic support for human beings in their societal contexts.

The passage of NYS and NYC climate legislation creates a unique opportunity to create new high-quality jobs. In 2017, NYC took its first steps to understand the intersection of Environmental Justice and its interconnectedness to workforce, housing, and economic development. NYC passed an Environmental Justice Policy Bill, Intro 886A, establishes an Interagency Working Group, consisting of representatives from city agencies and a special coordinator of E.J. appointed by the mayor. The Interagency Working Group goal is to develop a comprehensive Environmental Justice Plan to provide guidance and recommendations on incorporating Environmental Justice concerns into city decision making, operations, programs, and projects (Inez D. Barron 2017).

In April 2019, NYC committed to reducing the city's greenhouse gas (GHG) emissions to net-zero by 2050. Two-thirds of NYC's carbon emissions come from the heating, cooling, and operation of its buildings. Most property owners in NYC must invest in clean energy and energy efficiency retrofits. In addition to NYC, NYS committed to the country's most ambitious climate target of a 100% carbon-free economy by 2050, zero-carbon electricity sector by 2040, faster than any state in the nation, and 70 % renewable electricity[15] by 2030. NYS requires at least 35-40% of the energy program's benefits to go directly to frontline communities.

NYC's workforce system must realign to focus on impactful opportunities to implement ambitious climate solutions. Today, 159,000 NYS residents work in the clean energy sector, which comprises clean energy generation and energy efficiency industries. These workers enjoyed wage premiums of 12% - 32% for entry-level and mid-range skill levels compared to other industries. Furthermore, about 70% of clean energy employees receive healthcare, retirement, and paid vacation (NYSERDA 2019). To ensure equity in this growing sector, municipalities, workforce organizations, and employers must examine, deconstruct, and build new career pathways for New Yorkers who are not traditionally engaged in the clean energy sector. This opportunity, integrated adequately into local workforce ecosystems, can provide social, economic, racial, and environmental justice to frontline[16] communities.

The Value of Diversity in the Energy Sector

Renewable energy must make up 70-85% of the world's energy capacity by 2050 to avoid the most dangerous impacts of a warming climate (IPCC 2019). In dense urban areas like NYC, achieving that goal requires a rapid buildup in distributed energy generation and energy efficiency. The need for solar alone means thousands of new clean energy jobs in the United States. Although there are many individuals available to work, a gap exists between job opportunities and job seekers. In the energy sector, and across industries, employers face a hard time finding skilled laborers. In 2019, over 80% of clean energy employers who hired within the previous 12 months reported at least some difficulty hiring—up 10% since 2018—and nearly three out of every ten employers (28%) stated it was challenging to hire (NYSERDA 2019).

[15] Wind and solar

Hiring difficulty was linked primarily to applicants lacking experience, training, or technical skills. The occupations most frequently cited as difficult were technicians or mechanical support, sales, marketing, customer service, and management positions. Most critically, employers and employees both noted the importance of apprenticeship, prior work experience, and on-the-job training for candidates seeking to fill open positions. Figure 5. highlights the demographics of NYS's clean energy workforce shown to differ from a cross-section of the NYS population in several respects. Most notably, clean energy workers were disproportionately male and white[17].

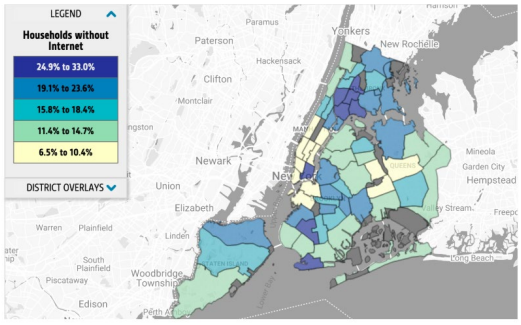
New York State Demographics

Category	New York State's population[8]	Clean Energy Workers in New York State[9, 10, 11]		
		All	Renewable Electricity Generation	Energy Efficiency
Female	51.4%	29.0%	27.9%	24.8%
Male	48.6%	71.0%	72.1%	76.0%
White	55.4%	73.2%	73.8%	79.4%
Hispanic/Latinx	19.2%	17.1%	15.9%	14.4%
Black	17.6%	7.9%	7.1%	6.7%
Asian	9.0%	8.4%	7.8%	5.0%
Native American	1.0%	1.2%	1.7%	1.5%
Pacific Islander	0.1%	1.0%	1.0%	0.7%

Figure 5 The demographics of NYS's clean energy workforce were shown to differ from a cross-section of the state's population in several respects. Source: NYSERDA 2019

Employers reported that websites (such as Indeed, Monster, CareerBuilder) were the most popular sources for respondents to find candidates, with 73% stating they use these websites. In NYC, just under one in six households across the city reported no means of accessing the internet in 2018 – that is, no dial-up, broadband, satellite, or cellular data plans. During COVID-19, 800,000 New Yorkers live in households without internet, including thousands who participate in safety net programs. 230,000, or 38%, of low-income households (earning below $20,000 annually) are without internet (CCNY 2020). The existing digital divide, specifically the lack of internet infrastructure perpetuates the issue that families will not be able to access job postings without internet access.

SHARE OF HOUSEHOLDS WITHOUT INTERNET ACCESS BY COMMUNITY DISTRICT, 2018



[17] New York City-specific clean energy workforce demographic data is not available.

Figure 6 The demographics of NYS's clean energy workforce were shown to differ from a cross-section of the state's population in several respects. Source: NYSERDA 2019

Family and friends were the next most common source at 46%. The reliance on personal networks can lead these companies to overlook candidates from diverse backgrounds or not spend the time to cast a wider net. In another survey of employees in the solar industry, BIPOC were much less likely to find their current position through an employee referral or by word of mouth. Only 28% of Latinx and 28% of Black or African American respondents indicated they found their jobs through a referral or by word of mouth. For comparison, 44% of white employees and 49% of non-Latinx employees found their position through an employee referral or by word of mouth (SEIA 2019).

Avoiding Similar Shortcomings

Research has repeatedly shown that diversity improves a company's bottom-line results, and this is particularly true for companies with diverse leadership. A 2018 study by McKinsey & Company found that companies in the top quartile for ethnic and cultural diversity on their executive teams were 33% more likely to have above-average profitability than companies in the bottom quartile. For executive teams with gender diversity, this likelihood rose to 21% (McKinsey & Company 2018). A study by the Boston Consulting Group measured revenue tied to innovation (products and services launched in the past three years), finding this revenue was 19% higher for companies with above-average diversity in management. Having a wide range of people at the table brings the necessary variation of perspectives needed to solve problems, as it stimulates more creativity, cooperation, and innovation than can be found in more monolithic groups of people. People with direct experience with issues are closest to solutions. Interacting with coworkers from diverse backgrounds can inspire employees to adopt new ways of thinking and communication. In the long run, it leads to better outcomes. The energy sector has an opportunity to change the dynamic.

The CLCPA and CMA acknowledge this. For the CMA, buildings citywide needs energy efficiency work, meaning that a variety of communities need to be engaged. The CLCPA recognizes that we will not reach our climate goals without reducing emissions and addressing environmental issues within low-income and BIPOC communities. We need to retrofit buildings in every neighborhood, which requires mass hiring and retention regardless of income or racial demographics. However, there is a distinct need and opportunity to connect the dots between the need to address clean energy these same communities to meet the talent needs of the sector.

COVID-19 significantly impacted energy-related workers. An estimated 958,500 jobs in April 2020, totaling 1.3 million jobs lost since the beginning of the pandemic. This represents a 12 percent drop in employment over the month of April, and a 13 percent drop in employment since the start of March, eliminating nearly all industry-wide growth measured since the first U.S. Energy and Employment Report five years ago (BW Research Partnership 2020).

Creating diverse employment opportunities throughout the different segments of the industry is critical to move forward with an energy resilient future post-COVID. The energy sector is one of the top ten sectors of the future for our state, country, and the global economy (Martin 2018). Coordinating between businesses in NYC and the educational system, helping companies find the talent they need within the five boroughs, and leveraging NYC's investments

and purchasing power to place more New Yorkers into jobs are three methods the energy sector can begin turning the dial on economic justice.

Enhancing Existing Systems

Designing an equitable workforce pathway requires organizational collaboration (Awareness), educational integration (Skill Development), and on-the-job opportunities (Launch). Supporting New Yorkers' connections to different clean energy pathways can support income mobility and the development of high-demand skills that employers are seeking. In the following case studies, we detail programs that successfully provide pathways for individuals facing systemic barriers to employment based on race and class, as well as general lack of access and awareness of career pipelines and professional networks. Case studies focus on programs for job seekers who are school-age youth (Energy Equity Fellowship), young adults (Green City Force), and adults of any age (MOS-CUNY Internship Program). All work closely with employers to determine curriculum and provide holistic support so that participants are positioned to thrive in career-track jobs in the energy sector.

Organizational Collaboration: Awareness

Millions of young adults in the U.S. have talent and motivation. However, they lack the opportunity to engage in a high- paying sector. Youth and young adults are less likely to work in NYC than almost anywhere else in the United States. In 2010-11, NYC ranked 95th among the 100 largest metropolitan areas in the employment rate for 16 to 19-year olds, at 19.3%; for 20 to 24-year olds, the figure was 54.5%, 97th out of 100 (HED 2015). Research has shown that youth from the most impoverished families, who presumably would derive the most significant benefit from an early experience of employment, are the least likely to have access to it. Existing certification programs which would alleviate the economic burden, require full-time, commitments of three-to-six months and cost as much as $15,000 (HED 2015). While young adults are interested in these programs, the absence of funding creates barriers to participation that diminishes their career pathway opportunities.

Creating a pathway that removes barriers and allows youth to explore STEM-related fields, specifically in energy, provides them with an opportunity to engage in a high paying sector. Technology is among the fastest-growing and highest-paying areas in NYC. Energy industry careers are one of the top ten in-demand careers now and in the future. STEM careers support youth to use their creativity and allow them to participate in work that can fulfill personal satisfaction and support wealth accumulation at an early age.

Case Study

To address the lack of awareness, Kinetic Communities Consulting (KC^3), an NYC Minority and Women Benefit Corporation, gathered insight on what opportunities existed in NYC's workforce to increase energy career awareness with youth. The NYC Department of Youth and Community Development (DYCD) has various programs for 16-24-year-old students to be involved in the workforce. The programs KC^3 engaged with DYCD are:

- Summer Youth Employment Program (SYEP)

    - SYEP is the nation's most extensive youth employment program, connecting NYC youth between the ages of 14 and 24 with career exploration opportunities and paid work experience each summer.
- NYC Ladders for Leaders
    - Ladders for Leaders is a nationally recognized program that offers outstanding high school and college students the opportunity to participate in paid professional summer internships with leading corporations, nonprofit organizations, and government agencies in NYC.
- Work, Learn & Grow Employment Program
    - The Work, Learn & Grow Employment Program (WLG) is an NYC Council-funded initiative designed to build off the experiences gained in the Summer Youth Employment Program (SYEP).

DYCD has been shown to have many positive effects on youth academically, developmentally, and economically. A survey of participants found that 75% reported they would not have had a summer job without SYEP. SYEP increased school attendance, especially among youth who had lower previous attendance levels (DYCD 2020). Furthermore, SYEP participants were more likely to attempt and pass the Regents Exam[18] for English and Math. Research also shows that job experience before the age of 25 is an essential indicator of later workforce success and financial stability. DYCD programs are valuable because they reach a wide variety of New Yorkers. In 2019, The program enrolled 74,453 participants, of whom 44% were Black, 25% Latinx, 12% Asian, 15% White, and 4% Other. 57% of participants were female, and 43% were male. Four thousand fifty-nine participants were vulnerable youth[19] (DYCD 2020).

In 2018, KC^3 worked with DYCD and the Mayor's Office of Strategic Partnerships to develop the Energy Equity Fellowship (EEF) program that would sync within the existing workforce programs. DYCD's programs are currently run through different nonprofits[20]. The first step to implement EEF was to sit down with each nonprofit and provide them with energy basics and NYC energy policy training. Building awareness with nonprofits achieves two goals: it helps them feel comfortable explaining to youth the opportunity the fellowship creates, and it helps the organization think creatively on how they can recruit more energy employers to hire youth.

KC^3 hosts a 12-week fellowship structured to train them on energy basics and new technology, deliver a team-project based presentation, and expose them to the industry. Throughout the fellowship, they learn about energy, building science, mechanical systems, climate legislation, and their fellowship goals. During the program, the fellows attend four career meets, a curated one-on-one with senior industry leaders where fellows can ask any questions on career development. The fellows attend site visits as well, so they can visually see a passive house, solar installations, and green roofs. In 2020 the fellowship has adapted and transformed to adjust for COVID-19 impact on Low-Income and BIPOC communities. Ensuring youth can

[18] NYS standardize testing

[19] Vulnerable youth defined by DYCD: foster care, homeless, preventative services through NYC Administration for Children Services

[20] All the nonprofits have been established institutions for decades, serving neighborhoods with the most need.

engage the sector, fellows are engaged in the fellowship virtually. The fellows are being paid for their time during the fellowship and given a stipend to pay for their internet and phone bill during the program, ensuring the digital divide is not a burden to entry and access.

It is essential to show the next generation the different aspects of energy. Not only are there engineering jobs, but there are financial jobs, social advocacy jobs, policy jobs, and other jobs that influence clean energy and energy efficiency. At the end of the program, the fellows present their project findings in a public event with industry leaders. Through this process, fellows build their leadership skills, gain visibility into the various career opportunities, and are equipped with the chance to jump right into a new field with an existing network. Creating awareness through each touchpoint and improving internship opportunities is one method the sector can continue to alter and support engagement for frontline BIPOC youth.

Educational Integration: Skill Development

The relationship between education and housing influences youth progress to adulthood. In NYC, BIPOC students are more likely to experience unstable housing[21]. In public school[22]s, 13% of Latinx students, 13% of Black students, and 5% of Asian/PI children experienced unstable housing (NYC HPD 2020). The stress, insecurity, and often cramped conditions that come with homelessness and unstable housing have a profound impact on students' ability to learn and perform in school (Chapman 2019).

The area youth live in determines which public school they can attend. The school zone system also dictates how much funding each public school receives. School zoning[23] and choice policies[24] negatively continue segregation and disparities in educational opportunities for low-income and BIPOC New Yorkers. Many low-income families, immigrants, and homeless families are not aware of NYC zoning policies. They may not have the ability to exercise choice due to language barriers, limited time and resources, and physical distance. 40% of students in public and charter schools identified as Latinx, 26% as Black, 16% as Asian/P.I., and 15% as White during the 2017-2018 school year, while NYC's overall population is 29% Latinx, 22% Black, 14% Asian/P.I., and 32% White.

Nearly 80% of students who graduate NYC Department of Education public high schools attend a City University of New York (CUNY) institution (CUNY n.d.). CUNY serves a diverse student body, especially those excluded from or unable to afford private universities. The importance of providing high quality, tuition-free education to the poor, the working class, and the immigrants of NYC is why CUNY was founded (CUNY 2019). Approximately three-

[21] Unstable housing: students being doubled-up with family and friends or living in shelter or some other form of temporary housing.

[22] For the purpose of this paper, public school is an elementary, middle, and high school funded by the Department of Education. For higher education public school, the paper specifies CUNY.

[23] Students and families can choose not to attend zoned schools. 30% of New York children exercise their right in choice due to lack of information on the process (Mader, et al. 2018)

[24] New York City school children receive priority in the admissions process for a specific elementary school that is linked to the specific school zone in which their family lives. As a result, the racial composition of the school children who live in each school zone is an important link to the enrollment patterns at elementary schools (NYC HPD 2020)

quarters of CUNY students identify as BIPOC, one-third were born outside the United States, 60% of students were the first in their family to go to college, and 80% attended an NYC public high school (Center for an Urban Future 2017). Many students attend CUNY tuition- and debt-free. CUNY schools are among the top 10 schools nationwide promoting social mobility (CUNY 2017). Not only does CUNY have a diverse student body, but studies have also shown that a vast majority of students stay in NYC, bringing their expertise to back to improve the lives of their neighborhoods.

Educational skills and employer engagement are necessary to create a diverse pipeline of clean energy sector workers. Jobs in this sector can improve household financial security and wealth-building opportunities, particularly with those who face systemic barriers to access. Tying employment to policy allows for students to be prepared not just for the skills in demand last year but for those in the market in the future as policy pushes industries forward.

Case Study

NYC Mayor's Office of Sustainability (MOS) develops policies and programs to reduce greenhouse gas emissions citywide. In 2019, MOS worked with the city council[25] to pass the Climate Mobilization Act[26]. While many municipalities have required buildings to meet specific efficient construction standards[27], CMA is the first legislative policy to demand that all buildings are built and operated efficiently to stay under an assigned carbon budget. New and existing buildings must be efficiently designed. Building operators need to operate buildings according to the design specifications[28]. These laws are both unique and first of their kind. Therefore both the incumbent workforce and university graduates are not receiving the requisite training in building energy systems. This new policy presents an opportunity to create an equitable energy workforce, prepared to support not only their own city's climate goals, but potentially to export their talent as other cities follow suit and develop similar policies.

In addition to developing policies, MOS runs programs that serve building owners, businesses, and institutions. One of its programs, the Carbon Challenge, provides support to leading retailers, banks, hotels, hospitals, and other major companies and institutions that are committed to reducing carbon emissions from their NYC operations. Many of the participants are household names (e.g., Jet Blue, WeWork), Fortune 500 companies (JP Morgan Chase, Pfizer), and major institutions (Memorial Sloan Kettering Hospital, Columbia University). Another program, the NYC Accelerator, helps building owners and property developers of buildings over 25,000 square feet throughout the process of performing energy efficiency retrofits or developing low-carbon new construction by connecting them to incentives, resources, prequalified firms, and advice. Through these programs, MOS has built strong relationships with global businesses and institutions, as well as architecture, engineering, affordable housing, and

[25] NYC local legislative body

[26] CMA included a suite of bills, including those requiring green roofs or solar on new rooftops, energy “grades” that need to be displayed prominently in the lobbies of large buildings, and PACE-enabling legislation.

[27] LEED Silver

[28] Anyone exceeding their carbon budget will face substantial annual fines, providing a strong incentive for the real estate industry to invest in the talent that will ensure compliance.

property management companies. Many of MOS's partners expressed difficulty finding skilled workers they needed to achieve their carbon reduction goals.

The importance of employer-informed hands-on and personalized education for expertise that universities are not teaching is critical. Upon discovering an industry-identified gap in the current workforce, MOS partnered with CUNY to provide opportunities for underrepresented groups to fill this gap. The CUNY Institute for Urban Systems Building Performance Lab (CUNY BPL) and MOS leveraged partnerships with industry leaders to create and implement a program comprised of an energy boot camp, 35 hour-training, and a 15-week internship geared at college[29] and graduate students. MOS tapped into existing relationships that were created through its building energy efficiency programs to develop a pipeline of engineering, architecture, and sustainability employers. All the employers who participated are household names or well-known companies in the deep building energy retrofit space, who typically recruited from prestigious and expensive private universities, most of which are outside of NYC.

CUNY BPL created training and curriculum that was responsive to employer needs over time. The energy boot camp is for students to learn about building energy efficiency concepts, deep energy retrofits, terminology, energy policies, and computer programs. The training includes the following topics: characterizing all HVAC systems and other critical systems related to energy efficiency, documenting equipment models and calculating the end of useful life systems, calculating the energy and cost-effectiveness of repair and replacement, calculating building energy loads to identify potential for high-efficiency air source heat pump technologies to provide space heating, cooling, and hot water production, performing solar potential and cash flow calculations, relevant NYC regulations and compliance strategies, and tenant engagement.

Cohorts contain 25 students, and 15 are placed in internships opportunities. Students can interview and work at companies to which they may otherwise not have access to. In 2018, more than half of the students who completed the training were placed in internships. Many of the students were asked by employers to stay longer in their internships or, in instances where students were graduating, offered full-time jobs in the company where they worked or another participating employer. Though there have only been two cohorts completed so far, most employers indicated that they would participate in subsequent cohorts, citing the impressive knowledge provided through the program and the talent and enthusiasm of the participating student. In the first two cohorts, between two thirds and three-quarters of students stayed in the field. One third to one-half of students were offered extended internships or full-time employment by the firm where they interned.

Impact of COVID-19 on Employer Engagement

COVID-19 has impacted how most companies in the energy sector conduct business. Some of the challenges have been budget cuts, hiring freezes, reduced clientele, layoffs, and furloughs. The pandemic impacted how employers interact with their staff. Social distancing has generated a need for transferring meetings, training, and other work-related activities to online platforms. Transitioning from in-person interaction and mentoring to conducting these activities digitally has proven difficult for employers, many of whom have opted to wait till the fall when NYC is open for business. This resulted in reduced summer internship opportunities, a delayed

[29] 3rd and 4th year students

hiring process, and recruitment of organizations that have traditionally not been engaged with the program, such as community development and environmental justice nonprofits.

MOS has coordinated with CUNY BPL to transfer the training material online and accommodate instruction via teleconferencing programs. The technical curriculum has been condensed to make the content easier to digest. CUNY BPL has been monitoring and facilitating student participation during trainings to support students properly. As NYC is slowly opening, we expect that there will be increased employer engagement for the fall internship. On-the-Job Opportunities: Launch

Opportunities for launching a career should be accessible to all individuals, regardless of whether they hold a 4-year degree. Leveraging NYC's economic development investments and purchasing power in sustainability can support inclusive hiring. NYC is the home to the New York City Housing Authority (NYCHA), the nation's largest public housing authority and the largest landlord in NYC. NYCHA's 180,000 units house more than 500,000 New Yorkers, roughly 1 in 15 city residents. The average income for NYCHA households is $24,423, which falls between the "very-low" and "extremely low" income categories at just 41% of the citywide median income (NYCHA, 2018). NYCHA is critical in providing affordable housing to low-income households. NYCHA has fallen under physical disrepair due to federal funding being cut in half over the last decade, putting vulnerable families in this "city within a city" at risk. Green City Force (GCF) works in partnership with NYCHA to improve employment outcomes for young adult residents while reducing NYCHA's carbon footprint and increasing sustainability and health in NYCHA communities: a necessity and a chance to drive economic opportunity.

GCF is youth-centered, employer-informed, and sector-driven in its approach. GCF works closely with employers, trainers, funders, and advocacy organizations to ensure that its training programs meet direct market demand and are aligned with current best-practices. GCF targets training, service experiences, and employer partnerships within the "Sustainable Buildings & Communities" sector, specifically jobs that encompass: energy efficiency, utilities, and renewables; construction, operations, maintenance, and management of buildings; waste management including recycling and composting; maintenance and management of green spaces; horticulture and food production; community health and sustainability education outreach. The largest share of alumni (nearly two-thirds) work in energy efficiency.

GCF focuses on working with NYCHA residents, ages 18-24, a group that NYCHA reports are unemployed at a staggering rate of 72% (RPA 2018), compared to citywide rates and to NYCHA's overall employment rate - where only 45.7% of all families report one or more members of the household as being employed (NYCHA 2020). Since 2009, GCF has engaged over 700 young adults drawn from 148 of the 316 NYCHA developments throughout the five boroughs of NYC. Roughly 94% of entering GCF Corps Members benefit from some additional form of public assistance before enrollment (SNAP, Medicaid, etc.). Based on data of the last four years: 98% of GCF members identify as BIPOC - an average of 65% as Black and 24% as Latinx; 40% of members are female, 59% male, and 1% are non-binary. GCF's work aims to disrupt systems that have excluded low-income BIPOC young people from the economy by providing a tangible alternative to young adults and a scalable model.

Awareness, skill development, and launching a career are critical interconnected components in addressing inequity in the clean energy workforce. Understanding the dynamic,

high-quality careers that exist in the sector, building skills valuable to employers, and gaining hands-on exposure to the industry through work, internship, or service year experience are all foundational components.[30] We need to ensure equitable access to the path it takes to build interest, boost skills, and foster connections to formulate a family-sustaining career in the clean energy workforce. This work is even more critical as part of a recovery strategy from COVID-19. Unemployment, environmental, and health disparities have been exacerbated by the COVID-19 pandemic, which makes the work of enlisting, training, mobilizing, and supporting young people from NYCHA for career pathways more urgent and relevant than ever.

Case Study

For the past decade, Green City Force has honed a training program, employment pipeline, and sustainability efforts focused within NYCHA built around a period of full-time AmeriCorps service. GCF employs a holistic, multi-faceted model that works with young adults recruited from within NYCHA, serving NYCHA communities, through a tiered approach to developing professional skills, hands-on experience, and certifications required to access green careers. In 10 years, GCF has enrolled 20 training cohorts with over 540 graduates. GCF is about connecting the dots between two major issues that cities face: youth employment and how to engage young people in the transition toward an inclusive and sustainable economy that is adapting to a changing climate.

By the end of March 2020, GCF graduates were facing immediate impacts of the COVID-19 pandemic, with 40% of surveyed alumni stating economic losses of reduced hours, layoffs, furloughs, and delayed hiring start dates. These financial losses left 9% of surveyed alumni food insecure, with an additional 20% in danger of becoming food insecure within 30 days. Also, many GCF alumni self-reported the loss of loved ones due to COVID-19, with some deaths causing unstable housing and health conditions. Over one-third of surveyed alumni expressed interest in access to a social worker or mental health workshop.[31] Extensive research has documented the association of recessions, mass layoffs, and prolonged periods of unemployment with an increase in income inequality and a devastating impact on mental health and life expectancy in the United States (McKinsey & Company 2020). The pandemic and its economic ramifications will be felt for months and years to come and has forced new levels of innovation on how the clean energy sector can adapt to a changing world of work. GCF's activities, which are centered on resident engagement and sustainability in NYCHA communities and low-to-moderate income homes, were disrupted by COVID-19. GCF has pushed back programming and is adapting skill training and hands-on experiences for typical in-person forms of engagement to virtual platforms, including virtual audits. This work is challenging because of the digital divide that NYCHA and low-income communities face with limited access to technology and reliable internet connectivity. GCF's model includes a core component, the Service Corps, which is the foundational experience for all participants. GCF partners with NYCHA's Office of Resident Economic Empowerment & Sustainability, who help get the word out about GCF's 4-10-month term of hands-on AmeriCorps service in public housing

[30] A service year is a paid opportunity to develop real world skills through hands-on service.

[31] Green City Force provides virtual and phone-based group and individual sessions, along with weekly health & wellness news blasts to all alumni from their social work team.

communities. Service-learning and the ethic of service are the driving forces in the GCF training model, building agency as well as skills, hands-on experience, and introduction to concepts of social, racial, economic, and environmental justice. Graduates are directly employed by a range of employers or join sector-focused alumni training and employment initiatives. An average of 79% of students admitted to GCF graduate, with an 80% placement rate in employment or college. GCF makes a lifelong commitment to graduates by continuing alumni career pathway development through career counseling, on-the-job coaching, access to additional technical training to achieve career advancement, and related follow-up support services.

GCF cultivates and supports employer partners to maximize job offerings for graduates. The organization manages a talent pipeline of alumni by facilitating an interview process to match graduates with either in-house work opportunities, related to energy efficiency contracts with the GCF Social Enterprise, or with external employer partners. As it pertains to the energy efficiency sector, GCF demonstrates how low-to-moderate income (LMI) energy efficiency services can be combined with job training and service-learning for effective environmental and workforce development outcomes. The sector-based pathway training for energy efficiency careers, called "Energy Boot Camp," prepares participants for the clean energy sector workforce. GCF's Energy Boot Camp familiarizes trainees with the specifics of their in-home energy efficiency work, including knowledge of conservation measures, dependable customer service skills, attention to detail, and ability to capture and input data, and an understanding of lighting and home appliance installation. Since 2016, GCF's Social Enterprise has been a job creation engine for an all-GCF graduate workforce called the Illuminators. GCF works with energy service providers and the New York State Energy Research and Development Authority to leverage investments in energy efficiency across NYC and at NYCHA to create high-quality work opportunities in-house for GCF graduates. The experience gained in the Social Enterprise qualifies graduates to join employer partners at higher level starting positions, than if they just graduated directly from the Service Corps. There are typically multiple steps along career paths towards family-sustaining work, and GCF ensures that graduates keep moving along a career path. Included here are two brief illustrations of actual GCF alumni:

- Martin joined GCF's Service Corps with no prior experience in energy efficiency. After graduating, he was hired to the GCF Illuminators as a direct installer. Seeing his work ethic and skills in the field, Ameresco hired him as a Site Supervisor. When Ameresco's contract came to an end, Martin returned to GCF as a Crew Leader under another contract with Constellation. After just a few months of working together, Constellation hired him to join their team as a Site Superintendent where he is currently employed.
- Earlton graduated from the Service Corps with no prior experience in energy efficiency before GCF. He worked as an Illuminator on an Ameresco contract, where he built up his experience and track record. Motivated to pursue a career in construction, he participated in the Green City Builders NYCHA Resident Training Academy (NRTA), a special edition of the more extensive NRTA program co-designed by GCF and NYCHA's Office of Resident Economic Empowerment & Sustainability. Earlton then completed a Local three exam prep course and is now an apprentice with Local Union 3 IBEW.

GCF represents an approach to training that acknowledges that workers need to be part of building the future of work and the future of cities. GCF views young adults from frontline

communities like NYCHA as the vital force for driving the emergence of "green cities"—by transforming their own lives, leading community transformation, and promoting the values of a new regenerative economy. Service, purposefully designed, can be a systemic solution to build active talent pipelines (Service Year 2020), as well as self-actualization for a livable and just worldwide ecology and economy. GCF's model, which relies on the work of The Corps Network, a national network of conservation corps, points to the potential of a citywide, scaled Climate and Equity Corps addressing critical city needs (City-Corps Partnerships 2019), with a priority focus on low-income BIPOC communities, enlisting the leadership and talents from within these communities. This concept applies to cities everywhere and aligns with priorities from the local community level to city and state clean energy objectives, to global Sustainable Development Goals.

Conclusion

Systemic challenges of housing, education, income, and environmental injustices are not separate issues. The policies we set today can be building blocks to correct the inequity many vulnerable communities face. Climate Change solutions can support populations who have been disproportionately impacted by implicit bias[32] that has led to structural racism[33]. Solutions should be universal in goals, but unless they are targeted in approach, the purposes of fairness and inclusion falter – not just BIPOC communities, but also for people living in rural areas, people with disabilities, and the elderly (Powell 2012). Climate change solutions can disrupt structural inequities that are based on demographic characteristics such as differences in gender, race, ethnicity, age, and income.

Coordinating between businesses in NYC, the educational system, and providing the next generation with the skillsets they need can be the beginning to address inequity. Early career *awareness*, *skill development,* and initial *launch* are essential first steps to creating a just transition. The Energy Equity Fellowship exposed young people to a variety of careers and career pathways in the clean energy, raising *awareness* while developing skills and professional networks. The MOS-CUNY Internship program provided *skill development* so that STEM students can explore energy careers and specialize in building energy systems while creating pipelines to employment at premier institutions that typically recruit from the Ivy League. Green City Force provides training and employment for youth in public housing in various green sectors, with individualized support to *launch* these youth into high-paying careers that advance community stewardship.

A just transition must include opportunities for individuals facing systemic barriers to career-track employment to advance in their careers to the point where they can create their

[32] Implicit bias: research suggests that most of us have implicit biases that can affect our behaviors and understandings. Because we have conscious control over – or, indeed, access to – only a small part of the processes going on in our brains, many of our thoughts and feelings, even during waking hours, occur without our express command or permission. This recognition helps explain inconsistencies between our conscious attitudes' actions or opinions of two people of different social groups may be interpreted quite differently, depending upon the groups to which they, and a given viewer, belong. (Powell 2012)

[33] Structural racism: the social, economic, educational, & political forces and policies that operate to foster discriminatory outcomes or give preferences to members of one group over others (Barker, 2003; Soto, 2004)

opportunities and open doors to others in their communities. Business owners can be critical partners in advancing workforce development and community wealth generation. The clean energy sector is one that is rapidly evolving and, therefore, will require that businesses continue to pivot and expand along with it. Case studies focus on programs for job seekers who are school-age youth (Energy Equity Fellowship), young adults (Green City Force), and adults of any age (MOS-CUNY Internship Program).

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