



New York City Green-Collar Jobs Roadmap

J.Mijin Cha with Jack Dafoe October 2009



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Preface

It's often said that New York City is America's greenest city. The city's residents live nearer to one another, walk more often, take transit *far* more often, and pass more progressive environmental and energy policies than just about anyone else in the country. So it is no wonder that New Yorkers have again struck out ahead to turn the vision of a new green-collar economy into a realistic blueprint for implementation.

The New York City Green-Collar Jobs Roadmap takes as a given that the city needs to adopt a greener, more sustainable economic growth agenda to thrive. New York is a global city surrounded by water, and as such it is particularly vulnerable to global climate instability and energy supply volatility. But the report does not simply state the need to move onto a more renewable and efficient energy path—it articulates the steps necessary to make sure that path leads to strong economic growth, good jobs, and broadly shared benefits for all New Yorkers.

Working with more than 100 stakeholders from business, labor, and community-based organizations, Urban Agenda took a hard look at what industries are likely to grow in New York in the coming decades, what types of jobs will be available in those industries, what type of training will be necessary for those jobs, and what kinds of policies will be critical to tie all those pieces together. The roadmap—which is the result of this collaboration—makes two particularly important arguments that should be taken to heart by all cities seeking to better integrate environmental and economic planning.

First, the report emphasizes that not all green industries are new, and not all green-collar jobs are new jobs. Therefore not all green-collar job policies should be aimed at new and emerging industries, like solar panel installation; some should be focused on expanding and improving existing industries and training programs, like the building and construction trades that provide the backbone for weatherization and retrofitting.

Second, the report takes a truly comprehensive approach to clean-energy policies. It includes recommendations for policies that help create a market for new renewable and efficient energy products and services—for example, improved building codes—and in turn help to grow existing industries and spur new green ones. It provides recommenda-

tions to ensure the jobs created in these new industries are high-quality jobs that provide decent wages and benefits. It also includes ideas for improving job training programs so that New Yorkers—especially low-income and underserved New Yorkers—are adequately prepared for these jobs. And finally, it includes critical recommendations for better inter-agency collaboration and data gathering.

The green jobs movement has gained tremendous momentum over the past decade, fueled in large part by local advocates and policymakers—including Urban Agenda and the New York City Apollo Alliance. We are at a crucial moment when that energy and vision must be translated into concrete local action—when the promise of green jobs must become the reality of sustainable economic development based on clean and energy efficient solutions. The New York City Green-Collar Jobs Roadmap shows us the way forward for one city, and in doing so provides a blueprint that any city can follow in moving from revelation to implementation.

Kate Gordon
Vice President for Energy Policy
Center for American Progress

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Executive summary

The New York City Green-Collar Jobs Roadmap comes from a positive vision for the city: An inclusive green economy that employs thousands of New Yorkers in green-collar jobs that help upgrade our infrastructure, improve the health of our communities, and reduce our nation's reliance on imported energy that degrades the environment. Environmental sustainability, however, comprises only half of the vision: Equally important is that green-collar jobs are also good jobs that offer family-supporting wages, benefits, and opportunities for career advancement.

The green economy encompasses a range of goods and services that help provide environmental benefits such as reducing greenhouse gas emissions, removing hazardous substances from water and land, improving air quality, and increasing urban vegetation. Ensuring that the jobs in this economy are good jobs is fundamental to preserving the middle class, increasing broadly shared prosperity, diversifying the local economy, and boosting the city's global competitiveness.

The economic downturn has given new urgency to finding innovative ways to create good jobs. We believe that a comprehensive, coordinated, citywide agenda that advances sustainability initiatives and prepares New Yorkers for green-collar jobs should be the cornerstone of any strategy to navigate New York City out of today's recession. It will provide immediate relief and lay the groundwork for a better future where the green economy is prosperous for communities, workers and businesses.

New York City's recent bold sustainability initiatives are a good start toward re-envisioning economic growth and developing green job-creating industries for the future. We are building the foundation of an economy in New York City that can create thousands of green-collar jobs, from our ambitious plans for deep cuts in greenhouse gas emissions to community-based programs planting trees and remediating contaminated property. Now we need to make the promise of green-collar jobs a reality.

The Green-Collar Jobs Roadmap seeks to fulfill this promise. It is the product of the Green-Collar Jobs Roundtable—a participatory effort of over 170 job-training organizations, community-based programs, businesses, and labor unions committed to creating green-collar jobs in New York City. The roundtable was convened by Urban Agenda and compiled data on green jobs and workforce development best practices while developing

over 30 recommendations for achieving the shared vision of a more sustainable, prosperous, and just New York City.

The recommendations in the roadmap are from a series of working groups that came together as part of the roundtable. The working groups looked at all aspects of a green economy, including the current landscape, training, employers, job standards, and target populations. Alongside these working groups the political strategy working group provided guidance on how to move the green-collar jobs workforce development agenda through legislative and political channels.

Joblessness and unemployment are at all-time highs with a 9 percent unemployment rate and 361,000 jobless in New York City alone. However, the conditions that have squeezed millions of low-income and working-class people out of New York City long predate the current recession. The roadmap recognizes that the key to growing a green-collar economy will be harnessing our existing resources, from elected officials dedicated to sustainability to workforce development organizations and community groups pioneering career development in emerging green industries by strategically applying the current system's lessons.

At the moment, however, New York City does not have the training, recruitment, pre-employment, and job-readiness infrastructure and business services in place to reach our ambitious sustainability goals, expand our green-collar workforce, and further develop the city's emerging, high-growth green sectors. We need to develop new training resources and partnerships and modify existing ones to ready our workforce for tomorrow's green jobs.

The roadmap lays out how we can do this, but it goes beyond traditional workforce development and industry support. The green economy's growth can revolutionize the way we build an industry's "human capital" and codify an approach that treats job creation, job quality, and environmental stewardship as interrelated parts of a long-term sustainability agenda. Green-collar job training should be more than career readiness—it should prepare New Yorkers for a world where every sector will incorporate aspects of sustainability.

The roadmap's recommendations comprise a step-by-step plan to grow an inclusive green economy and can be classified into six overarching issue areas:

Grow the green economy to create good green-collar jobs

Implementing policies that increase market drivers is necessary to ensure that jobs exist. Market drivers can be increased by expanding current programs, implementing large-scale retrofits and renewables development, promoting local manufacturing and green product development, and offering incentives to new industries. Implementing new policies will also diversify the city's approach to job creation and offer employment to a wide spectrum of workers with a range of skills in environmentally sustainable areas.

Ensure green jobs are good jobs and reach target populations

The importance of breaking the pattern of low-road jobs cannot be overstated. What's more, projects subsidized with public funds that pay poverty wages put a double strain on our resources: Not only is the public helping to fund the project, but the poorly paid workers need additional resources just to make ends meet. Incorporating job standards into public projects would break this pattern. Sustainable working conditions, occupational health and safety oversight and access to the safest workplace materials and products available must be promoted to protect workers health and create healthy working environments.

The historical exclusion of disadvantaged communities must also be overturned. Promoting community-led development and striking barriers to employment will start making the new economy inclusive and provide resources to historically underserved areas. We must empower all New Yorkers to take part in our city's sustainability efforts and develop long-term career pathways that bring people out of poverty by providing good wages, benefits and advancement opportunities.

Help current workers and employers transition into "green" workers and employers

The "new" green economy will not be composed of completely new jobs and skills—in fact, the new work will mostly build on existing skill sets. For instance, building operators only need minimal skill upgrades to operate equipment that maximizes energy efficiency. Training tomorrow's public and private sector workforce and transition incumbent workers to new occupations can be done by incorporating green-collar training opportunities into career and technical education schools, the City University of New York, labor-management training and apprenticeship programs, Workforce 1 Centers, and other citywide workforce development initiatives.

Upgrading skills will help transition our currently trained workforce into the new economy. Likewise, helping existing businesses green their operations will save them money on utility bills and provide a competitive edge to their businesses.

Increase coordination and cooperation between city agencies and between local, state, and federal efforts

These recommendations provide ways to better coordinate intergovernmental efforts ranging from cross-agency cooperation to develop adult education curriculum to local, state, and federal cooperation to maximize resources for green-collar job workforce development. For example, green job training and job creation efforts should be aligned by leveraging federal and state resources, such as funds from the American Recovery and Reinvestment Act.

Expand and green existing programs

“Greening” existing programs is a relatively easy way to begin building a trained and ready workforce for the new green economy. Incorporating green skills into existing training programs, for instance, would give existing workers the skills they needed for the new economy, yet at relatively low cost.

The City should also coordinate workforce development with existing sustainability efforts by integrating training and recruitment strategies into the city’s green initiatives, programs, and requests for proposals to streamline the expansion and greening of existing programs.

Collect data so the growth of the green economy is prosperous

Collecting data and reviewing programs for effectiveness will ensure that resources are spent efficiently and programs are being adopted to best serve the needs of businesses, communities, and workers.

The economic and environmental challenges facing us are clear, and the consequences of inaction are dire. But together we can bring New York City into the future and make it a more prosperous, sustainable, and just place to live and work.

Introduction

The New York City Green-Collar Jobs Roadmap comes from a positive vision for the city: An inclusive green economy that employs thousands of New Yorkers in green-collar jobs that help upgrade our infrastructure, improve the health of our communities, and reduce our nation's reliance on imported energy that degrades the environment. Environmental sustainability, however, comprises only half of the vision: Equally important is that green-collar jobs are also good jobs that offer family-supporting wages, benefits, and opportunities for career advancement.

Ensuring that green jobs are good jobs is fundamental to preserving the middle class, increasing broadly shared prosperity, diversifying the local economy, and boosting the city's global competitiveness. The green economy encompasses a range of goods and services that help provide environmental benefits such as reducing greenhouse gas emissions, removing hazardous substances from water and land, improving air quality, and increasing urban vegetation.

New York City's recent bold sustainability initiatives put it on the path toward re-envisioning economic growth and developing green job-creating industries for the future. From its ambitious plans for deep cuts in greenhouse gas emissions to community-based programs planting trees and remediating contaminated property, we are building the foundation of an economy in New York City that can create thousands of green-collar jobs. Now we need to make the promise of green-collar jobs a reality.

"This has been an exercise in democracy. It hasn't always been easy. But voices that aren't always included have been incorporated."

— Edward F. Ott, Chair, NYC Apollo Alliance

The Green-Collar Jobs Roadmap is the product of the Green-Collar Jobs Roundtable—a campaign of more than 170 job-training organizations, community-based programs, businesses, and labor unions committed to creating green-collar jobs in New York City. Convened by Urban Agenda, the roundtable compiled data on green jobs and workforce development best practices while developing more than 30 recommendations for achieving the shared vision of a more sustainable, prosperous, and just New York City.

At the moment, however, New York City does not have the training, recruitment, pre-employment, and job-readiness infrastructure in place to reach our ambitious sustainability goals, expand our green-collar workforce, and further develop the city's emerging, high-growth green sectors. We need to develop new training resources and partnerships and modify existing ones to ready our workforce for tomorrow's green jobs.

The roadmap emphasizes the interconnected path of implementing policies that grow the market and create more jobs and work, ensuring that the jobs created are good jobs that bring people out of poverty, and are available to all New Yorkers—particularly populations that have been historically excluded from economic growth. Each element is as essential as the next and all three must exist for a sustainable, prosperous, and just New York.

Organization of the roadmap

“The New York City Green-Collar Jobs Roadmap” takes a detailed look at the city’s current capacity and future potential to create a green economy that is equally prosperous for businesses, communities, and workers. The report is divided into four sections:

The first section, “The Current Landscape: Green Jobs Sectors,” analyzes the current scope of New York City’s green-collar economy by outlining five emerging, high-growth green sectors: energy efficiency and renewable energy, urban forestry, green product development and manufacturing, transportation, and environmental monitoring and remediation. We analyze the scope of work required in each sector and the current market drivers for these industries.

The second section, “The Current Landscape: The Jobs,” outlines New York City’s green-collar economy today and looks at the city’s current training programs, employment opportunities, and employers. Here we describe the job titles and skills required and analyze future potential demand for these skills.

The third section, “Good Jobs/Green Jobs: Toward a High-Road Green Economy,” turns to what New York City can do to link underserved, underrepresented populations with new and emerging green-collar jobs. Strategies include training or retraining current and future generations, implementing strong job standards, and reaching out to target populations. This section also presents best practices for strong job standards and community-based approaches to workforce development.

The fourth section, “Green Pathways out of Poverty: Overcoming Employment Barriers to Build an Inclusive Green Economy,” details how to ensure that historically underrepresented communities have equal access to good, green jobs. The section highlights best practices for community-based programs to provide skills training and how to overcome barriers to employment.

All sections reinforce the central theme of the roadmap: Any economic growth must be equitable for businesses, communities, and workers. Fundamental to this effort is making sure that green-collar jobs are good jobs and available to all workers while simultaneously helping to grow businesses.

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The current landscape: Green-job sectors

The Green-Collar Jobs Roundtable began by analyzing current green job employment in New York City. Roundtable members identified five sectors that dominate the green jobs outlook—as well as the market forces and public policies that are driving their growth—recognizing that an effective green-collar workforce development plan must address the green economy sectors with the greatest growth potential and the greatest demand for trained workers.¹

Five emerging green sectors are especially ripe for job growth in New York City and already offer or could offer green-collar job employment:

- Energy efficiency and renewable energy.
- Urban forestry.
- Green product development and manufacturing.
- Transportation.
- Environmental monitoring and remediation.

All five sectors are growing at least in part due to a number of bold sustainability initiatives launched by the city over the past few years. On Earth Day 2007, for example, New York City Mayor Michael Bloomberg released PlaNYC 2030, a blueprint to make the city environmentally sustainable in the long term while preparing for a projected 1 million new residents by 2030.² PlaNYC includes 127 initiatives to reduce energy use citywide, clean up contaminated land and waterways, increase neighborhood parkland, expand affordable housing, and reduce greenhouse gas emissions, among other goals.

Since its release two-thirds of the initiatives have been completed or launched, with clear effects on the city's operations and the private sector, particularly in energy efficiency.³ These municipal initiatives are not being implemented in a vacuum. They are complemented by and often coordinated with federal, state, and community-led initiatives. The high-growth sectors outlined below have been shaped by these efforts.

The sectors

Energy efficiency and renewable energy

This sector covers goods and services that cut greenhouse gas emissions, reduce our reliance on fossil fuels, and reduce overall energy use. Strategies for stabilizing and greening the energy supply are a major component of ensuring the city's long-term competitiveness and viability, and these strategies will help address several challenges including:

- Rising energy costs for individuals and businesses.
- Transmission reliability issues from an aging and overtaxed electricity distribution grid.
- Greenhouse gas emissions that contribute to global warming.
- Air pollution from electricity generation that negatively affects community health.

In New York City the operation of buildings—heating, cooling, and electricity—is by far the primary consumer of energy. In fact, buildings account for 75 percent of energy use citywide and the burning of fossil fuels to power buildings accounts for almost 80 percent of the city's greenhouse gas emissions.⁴ Also, while there are ample opportunities for new green construction, existing buildings will make up 85 percent of New York City's building stock in 2030.⁵ For these reasons increasing energy conservation, energy efficiency, and the use of alternative energy for existing buildings is crucial to addressing the city's future energy needs.⁶

The energy efficiency and renewable energy sector's scope of work

The roundtable investigated four major high-growth subsectors:

- **Building audit-retrofits:** A building retrofit is an electrical, mechanical, and/or structural upgrade to an existing building aimed at increasing energy efficiency, improving indoor air quality, and mitigating greenhouse gas emissions.⁷

A retrofit is typically preceded by a specialized assessment of a building's energy use and system performance, known as an energy audit.⁸

- **Energy efficient building maintenance:** Energy efficient building maintenance entails the proper operation of newly installed or existing energy-efficient equipment and systems so a building can maintain peak efficiency.⁹
- **Energy management:** Energy management includes the broad range of services that help a building reduce and strategically manage its energy use over time. Energy management overlaps with energy efficient building maintenance, but it often involves installing advanced technology systems to monitor and control energy use, such as advanced electricity “smart meters.” This subsector also includes testing and balancing

Buildings account for 75 percent of energy use citywide and the burning of fossil fuels to power buildings accounts for almost 80 percent of the city's greenhouse gas emissions.

newly installed building systems (“commissioning”) or existing systems (“retrocommissioning”) to verify they are working at peak efficiency.

- **Renewable energy technology installation:** Renewable energy comes from natural inexhaustible resources such as the sun, wind, and tides. Renewable technologies to generate electricity, heat, or cooling include solar photovoltaic or PV panels, solar thermal systems, wind turbines, tidal turbines, geothermal systems, and anaerobic digesters.¹⁰ Many of these systems can be installed at a building site to power an individual building or campus, or connected to one another to form alternative energy plants feeding electricity into the grid like a conventional power plant.

The energy sector's major market forces

Several policies, projects, and programs are driving the growth of the clean and efficient energy sector in New York City.¹¹ A few of the most important catalysts are highlighted below as examples, and a more comprehensive list can be found in the appendix.

Municipal initiatives

The Bloomberg administration and the City Council, in conjunction with a broad range of stakeholders, have undertaken several initiatives under PlaNYC 2030 to reduce city-wide greenhouse gas emissions by 30 percent by 2030 while meeting the city’s projected energy demand.

The city plans to finance a suite of municipal building efficiency projects with an annual commitment of 10 percent of the city’s energy budget—approximately \$80 million in fiscal year 2008. As of April 22, 2008, the Energy Planning Board had launched 14 initiatives.¹² These initiatives are expected to create about 124,000 jobs in construction, maintenance, and engineering over the next 10 years.¹³

The City Council also introduced the Greener, Greater Buildings Plan in 2009, which is made up of four pieces of legislation that will require buildings over 50,000 square feet to benchmark their energy and water use, undergo periodic energy audits, and implement retrofit measures that can be paid back within five years.¹⁴ This legislation is predicted to create over 2,000 new jobs in energy auditing and thousands of temporary construction jobs over 10 years.¹⁵

New York City’s government has also led other cities in renewable energy, notably releasing a request for proposals for the installation of 2 megawatts of solar panels on municipal rooftops, which would effectively double the solar capacity installed in the city.¹⁶ Solar energy investment would create 42 percent more job-years per dollar than a comparable investment in fossil fuel.¹⁷

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State and regional energy initiatives

The New York State Energy Research and Development Authority efficiency and clean energy incentive programs have, since 1975, reduced participant energy costs by more than \$340 million per year; served over 60,000 low-income households, with average household energy bill reductions of \$220 per year; and created and retained 3,700 jobs.¹⁸ In New York City NYSEERDA has played an especially important role in growing the market for building energy efficiency services in the private sector. NYSEERDA's New York Energy Smart Program, for example, created roughly 5,500 jobs from 1999 to 2006, and is estimated to create 4,201 jobs from 2007 to 2016 in the building retrofit and energy efficiency industries.¹⁹

Other market drivers include the recently passed Green Jobs/Green New York bill that provides for 1 million residential retrofits statewide; energy efficiency portfolio standard, which require 15 percent of New York State's reduction in electricity use to come from efficiency; the Regional Greenhouse Gas Initiative, a multistate carbon cap-and-trade initiative that aims to reduce greenhouse gas emissions 10 percent by 2018 and raise money for efficiency programs across the state; and the renewable portfolio standard, which requires that 25 percent of the state's electricity come from renewable sources by 2013.²⁰

Federal programs

The Weatherization Assistance Program helps low-income families permanently reduce their energy bills by improving their homes' energy efficiency. Since 1976 the program has helped 6.2 million low-income families reduce their energy bills by 32 percent on average, or about \$350 per year at current prices, while helping to create over 8,000 technical jobs in low-income communities.²¹ In New York City more than \$91 million has been tentatively allocated to 15 weatherization providers under the American Recovery and Reinvestment Act.²²

In addition to the increased funds for weatherization the act also provided New York State with smart grid development funds, Energy Efficiency Community Block Grants, and the Energy Efficiency Appliance Rebate Program.²³

Private sector energy initiatives

While public policies are critical to help bring renewable and efficient energy systems to scale, the private sector will ultimately provide the bulk of the financing and infrastructure necessary to anchor New York City's green economy. Policies like net metering, which allows private owners of renewable energy systems to sell excess energy they produce; loan guarantees, tax credits, and tax abatements; and other programs aimed at the private sector can help build a stable market for renewable systems. In turn, these policies give confidence to new and emerging businesses that spring up to meet growing demand for clean energy.

Helps low-income families permanently reduce their energy bills by improving their homes' energy efficiency.

Renewable energy companies

Several companies are producing solar, wind, and tidal energy in New York City

Companies engaging in innovative, renewable energy efforts include:

Alteris Renewables, Inc., the largest integrator of renewable energy systems in the Northeast with over 2,000 solar photovoltaic and solar thermal energy installations, recently acquired the New York-based solar installation company, Renewable Power Systems.²⁴ This expansion will allow Alteris Renewables and Renewable Power Systems to cooperatively bring better designs, more affordable solutions, improved customer service, and a wider array of financial options.²⁵

Bluewater Wind, the leading developer of offshore wind energy in the Northeast, recently partnered with the Long Island Power Authority to build a wind park located more than six nautical miles offshore that will provide energy for 42,000 Long Island homes.²⁶ Although no policy or technical assessment has been done, this project indicates a huge potential for homes and businesses in New York City to draw energy from offshore wind parks in Long Island in the future.²⁷

Verdant Power's Roosevelt Island Tidal Energy project in New York City's East River was launched in 2002 as a pilot for generating electricity from the river's tidal energy. It is currently the world's first grid-connected array of tidal turbines able to produce 80 megawatts of electricity for commercial uses.²⁸ It completed its demonstration phase in 2008 and is now being built out to produce commercial power on a megawatt scale.²⁹

Urban forestry

Urban forestry is “the management of vegetation, particularly trees and forests, to provide environmental benefits and improve the quality of life of people who live, work, and spend their leisure time in urban landscapes.”³⁰ Trees and other vegetation improve economic sustainability in urban communities by attracting tourists and investment, increasing local forestry jobs, and increasing property values. Increased urban vegetation has also been correlated with improved community health and reductions in crime.³¹

Urban greenery:

- Improves air quality.
- Protects stormwater management systems and reduces combined sewer overflows.
- Reduces energy use and the urban heat island effect by cooling buildings (green roofs) and streets through shade and heat absorption.
- Extends the life of paved surfaces by cooling street asphalt.
- Provides local, healthy, and affordable sources of produce—for example through community gardens.



Urban forestry's scope of work

UPROSE youth teaching urban forestry.

New York City's urban forestry sector includes two major subsectors.³²

- **Park maintenance, tree planting, and open space design**—This subsector includes horticultural, landscape architecture, operational, and construction-based work related to New York City's parks, playgrounds, and "GreenStreets" street parks, trees, and vegetated open spaces
- **Green roofs**—Green roofs are alternatives to conventional roofs and are partially or completely covered by vegetation supported by a special lightweight soil aggregate. Green roof plants are often hardy and succulent, and they can tolerate drought and extreme temperatures. Among their many benefits, green roofs help lower building temperatures, filter air pollution, lessen pressure on sewer systems by absorbing storm water, and reduce the urban heat island effect.³³

Urban forestry's major market forces

- **Street Trees programs**—Led jointly by the New York Restoration Project and the Parks Department, the 10-year MillionTreesNYC initiative's goal is to plant a million trees across the five boroughs of New York City by 2017.



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- **Parks programs**—The City is in the planning phase for expanding and completing eight large destination parks in all five boroughs. The GreenStreets program, a partnership between the Parks Department and the Department of Transportation, converts paved traffic islands and medians into vegetated spaces. Mayor Bloomberg has funded an additional 156 staff to carry out this initiative.³⁴
- **Green roofs programs**—A new law passed by the City Council lets building owners apply for a one-year property tax credit up to \$100,000 for the construction of green roofs. The program will expire on March 15, 2013 unless extended. The credit covers approximately 25 percent of the typical materials, labor, installation, and design costs associated with installing a green roof.³⁵

Mock-up of Marine Park Pavilion with AFSCME DC37-Local 375 members.

Green product development and manufacturing

Manufacturing has long been declining nationwide. However, the recent struggles of the financial and real estate sectors and the growing awareness of global warming's threat have increased the public's recognition of domestic manufacturing's importance. Local green manufacturing, when coupled with increased development of renewable energy



Bronx-based Globus Cork, a sustainable cork flooring manufacturer.

systems, can bring needed dollars and jobs to struggling regions that have lost manufacturing jobs but that still have usable manufacturing facilities and a well-trained manufacturing workforce.

For example, the Renewable Energy Policy Project, a nonprofit renewable energy research organization, estimates that a national expansion of the U.S. wind industry could bring about 150,000 to 230,000 jobs and about \$50 billion to \$77 billion in investments to states and regions that have experienced heavy manufacturing job losses.³⁶

Historically, New York City has had a vibrant and active manufacturing sector.³⁷ Despite years of manufacturing job losses and the redevelopment of industrial spaces, the city still boasts a surprisingly robust manufacturing sector, with about 7,000 manufacturing firms employing over 100,000 workers. Thirty percent of these workers do not have high school diplomas.³⁸ Increasing investment in green manufacturing in New York City would not only bring needed jobs but also decrease greenhouse gas emissions by reducing the distance between manufactured goods and their consumption in America's largest city.

Green product development and manufacturing's scope of work

New York City's green product development and manufacturing sector includes five major subsectors:

- **Green manufacturing:** Green manufacturing involves making manufactured products and the manufacturing process safer for the environment and human health. On the product side it includes the use of less toxic or nontoxic materials, post-consumer recycled content, and locally sourced materials. This subsector also includes the manufacture of products used in renewable and efficient energy systems, such as the gearboxes used on small-scale wind turbines. On the process side it includes improving operational energy efficiency, onsite recycling, and employee occupational health and safety.
- **Deconstruction:** Deconstruction is the process of carefully dismantling and removing useable materials from structures for reuse, recycling, and waste management. It is an alternative to demolition, and it maximizes the recovery of valuable building materials for reuse and recycling while minimizing the amount of waste destined for landfills.
- **Reuse:** This subsector redistributes unwanted yet perfectly usable materials and equipment, including items from demolished structures. Businesses, nonprofits, schools, community groups, and individuals benefit from the reuse industry as donors, recipients, sellers or buyers.
- **Recycling:** Recycling is the collection, sorting, and reprocessing of used material—for example, plastic, paper, and glass—into new raw materials.
- **Remanufacturing:** Traditionally known as “rebuilding,” remanufacturing is a process of disassembling worn-out or discarded equipment, recovering sound and usable parts, and reusing them to build new, complete products. It is considered a green subsector because it promotes reuse and waste prevention and discourages the use of virgin materials.

Green product development and manufacturing's major market forces

Both city policies and private programs are creating demand for green product development and manufacturing, including:

- Leadership in Energy and Environmental Design standards and Local Law 86.³⁹
- Industrial business zones.
- New York City Solid Waste Management Plan.
- New York City Materials Development Program.
- Office of Recycling Outreach and Education.

Transportation

Transportation in a green economy encompasses expanding mass transit, retrofitting automotive vehicles to reduce emissions, and the sale, repair, and fueling of alternative automotives such as hybrid cars.

Mass transit reduces fossil fuel use and greenhouse gas emissions while encouraging more compact development patterns. New York City has the highest rate of public transportation use of any American city,⁴⁰ and two-thirds of mass transit riders nationwide live in New York City or its suburbs.⁴¹ It is therefore uniquely positioned to create jobs through mass transit.

Outside of mass transit, New York City has also been promoting alternative automotive vehicles such as hybrids and automotive pollution reduction technologies that could support local jobs in next-generation auto repair and auto retrofits.

Transportation's scope of work

The roundtable chose to focus its transportation-related discussion on mass transit due to the city's high rate of mass transit ridership and the number of jobs created through mass transit. New York City's mass transit system encompasses the Metropolitan Transportation Authority's subways, buses, ferries, and railroads; the Port Authority's light rail and ferries; and an array of independent bus and ferry service providers. More than other sectors, transit worker training must focus on retraining current transit workers to adapt to new technologies and increased scale of operations instead of training for a completely new set of workers.

Transportation's major market forces

Generally, transportation has different market drivers than the other sectors discussed in this report, and legislation heavily dictates whether mass transit opportunities expand. The mass transit authority is a quasigovernmental agency, so the opportunities for private operators to engage in transit expansion—outside of manufacturing more transit vehicles—are limited. Existing market drivers in New York City include:

- **Mass Transit Authority Capital Plans:** The Mass Transit Authority's 2008-2013 capital budget outlines billions of dollars of investment in projects that would improve local commuter rail service, provide new commuter rail access to Manhattan, and expand transit access to underserved areas. The MTA's previous five-year capital plan was estimated to have created 38,500 jobs annually for nine years.⁴² However, the extent of the capital plan's implementation remains uncertain because of recent budget shortfalls.
- **Mass Transit Authority Renewable Energy and Sustainability Initiatives:** The MTA's Blue Ribbon Commission identified several priority sustainability initiatives for the coming years.

Environmental monitoring and remediation

Environmental monitoring and remediation makes sure our aging infrastructure, building stock, and vacant land are safe and clean for future greener development by testing and cleaning contaminated land, water, and air.

Toxic and hazardous substances lie in many of New York City's industrial grounds and buildings. Before policies and programs were implemented to regulate these substances, industrial land was regularly polluted with lead, asbestos, and other contaminants. Many sites remain toxic decades after dirty industries relocated or cleaned up their products and processes. These contaminated sites, known as brownfields, can increase disease risks due to the presence of pollutants; pose a physical danger due to compromised infrastructure; and reduce community "connectedness," private property values, and the tax base due to increased blight.⁴³

Environmental monitoring and remediation's scope of work

The roundtable focused mainly on brownfield remediation, which is defined by the EPA as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."⁴⁴ Remediation's goal is to make a brownfield safe and clean for development or other uses.

Environmental monitoring and remediation's major market forces

Brownfield Remediation Programs: The Brownfield Opportunity Area program, which is administered by the New York State Department of State and the New York State Department of Environmental Conservation, awards grants to municipalities and community-based organizations to remediate and develop brownfield sites. Recently, \$1.8 million was awarded to 10 proposed projects across all five boroughs to perform pre-nomination or nomination studies to perform basic and preliminary analysis of areas affected by brownfield sites. No job creation assessment has been conducted at these stages.⁴⁵

The Brownfield Cleanup Program—coordinated by the New York State Department of Environmental Conservation—helps the private sector remediate brownfields with the goal of reducing the development of virgin land or "greenfields."

The New York City Office of Environmental Remediation was established in April 2009 to advance the remediation and development of brownfields that might not be funded under the Brownfield Opportunity Area program. The Office of Environmental Remediation plans to spend \$61.5 million through 2030 in capital construction projects, potentially creating 450 temporary jobs. It plans to spend \$2 million through 2030 in operations, potentially supporting 50 permanent jobs.⁴⁶

The New York City Office of Environmental Remediation was established in April 2009 to advance the remediation and development of brownfields that might not be funded under the Brownfield Opportunity Area program.

The current landscape: Jobs

New York City’s emerging high-growth green sectors require a well-trained workforce. The good news is that New York City has a highly developed and effective training infrastructure in place that’s been preparing incumbent and new workers in emerging sectors for decades (see sidebar below). Additionally, many existing training programs can provide a strong foundation for green job development because existing sectors share a high degree of skill overlap with the emerging, high-growth green sectors identified by the Green-Collar Jobs Roundtable.

Efforts to equip New Yorkers with hard skills in green sectors must be significantly ramped up, however. In the coming years a more coordinated, streamlined green training and certification system will be absolutely necessary to realize the full job creation potential of the emerging green economy and meet the city’s ambitious sustainability goals.

This section of the roadmap examines the required skills, existing training resources, and key training gaps for green-collar job titles across the five green job sectors, and makes recommendations for strengthening green-collar job training in New York City by expanding, linking, and improving green job training, certification, and accreditation with a primary focus on hard skill acquisition for high-growth occupations.

New York City’s green jobs and training

As shown above, much of green economic growth will be based not on “new” jobs, but on new work in existing occupations. Energy efficiency and renewable energy jobs, for example, are deeply embedded in many existing construction and manufacturing occupations and often only require new training and basic education in environmental practice and technologies.

The following lists the jobs, skills, certifications, and training providers for the five emerging, high-growth sectors mentioned in the last section. The jobs titles listed below adopt titles that appear in the Green Construction categories according to the New York City Labor Market and O*NET documents. Otherwise, job titles are taken from the industry experience and expertise of the roundtable working group members.

Much of green economic growth will be based not on “new” jobs, but on new work in existing occupations.

New York City's workforce development infrastructure

The city has well-developed workforce training programs that can help with green job development

The existing workforce development infrastructure is comprised of several crucial components:

Workforce 1 Career Centers: These centers provide job seekers with many employment services, including career advisement, job search counseling, skills training, and job placement. They are operated by the New York City Department of Small Business Services in coordination with the New York State Department of Labor and the City University of New York.

Career and Technical Education High Schools: At Career and Technical Education High Schools, students receive instruction in an industry-specific area and graduate high school with industry-specific competencies and skills. CTE graduates can go on to pursue postsecondary education, further industry training, and/or immediate entry into the workforce.

Union and union-affiliated training programs: Labor unions in a wide-range of fields—including health care, building management, the construction trades, and government—run industry-standard apprenticeship and training programs for their members. Several training programs are union-affiliated but offer instruction to nonmembers.

City University of New York: New York City's public university runs numerous career training programs and issues several job certifications in fields ranging from construction to automotive technology.

New York City Employment and Training Coalition: The New York City Employment and Training Coalition is a membership association of workforce development practitioners, community-based organizations, community colleges, and union-affiliated training programs that collects and disseminates best practices, provides technical assistance, and advocates for policies that support workforce development programs for unemployed and underemployed New Yorkers.

Department of Youth and Community Development: This city agency runs several training, workforce development, and employment placement programs for young New Yorkers primarily between the ages of 14 and 21. These programs include the Summer Youth Employment Program, NYC Ladders for Leaders, Young Adult Internship Program, In-School Youth Program, and the Out-of-School Youth Program.

This section also discusses the demand for each job and identifies any potential training gaps. We conclude by offering recommendations for how to improve New York City's existing training infrastructure.

Energy efficiency and renewable energy jobs

Energy analysis jobs

Job titles: Energy auditor, multifamily energy analyst, engineer

Required skills:

- Advanced computer/software proficiency.
- Building operations skills.
- Mechanical skills experience.

- Advanced math skills.
- Strong organizational and management skills.
- Strong writing skills.
- Understanding of building science (how air and heat flows inside a building envelope).
- Understanding of heating, ventilation, and air conditioning systems.
- Quality control analysis skills.

Position descriptions:

Energy auditors and multifamily energy analysts inspect a property prior to a building retrofit or energy efficiency upgrade and identify cost effective energy saving measures and structural improvements. Licensed engineers can also perform these assessments, known as energy audits, or can plan the scope of work for a retrofit based on energy audit information.

The scope of work and skills involved in an audit vary depending on a building's size and the complexities of its systems.

Auditors of small buildings, which are typically one- to four-family homes:

- Compile data on energy use with standard auditing tools such as blower doors to test air and heat flow, manometers to measure fluid pressure, and infrared cameras to examine insulation density.
- Work with energy modeling software such as EA-QUIP or TREAT to determine energy use patterns.
- Prepare written and oral reports for building owners and contractors to recommend retrofit measures that would best increase building energy efficiency and make system upgrade and replacement specifications.

Auditors of large residential and commercial buildings must be familiar with complex building energy and mechanical systems, such as advanced boiler controls, cogeneration technology, elevator motors, and steam distribution systems, as well as auditing tools for larger properties. In all cases communication and management skills are essential. Often auditors will be responsible for overseeing retrofits.

Major employers:

Most energy auditors are employed by private contractors that specialize in energy audits. Auditors also work as part of energy efficiency firms specializing in installing energy efficiency measures that provide audits as a first step.

Demand:

As incentives for home energy efficiency increase (see section on NYSEERDA below), the demand for energy auditors will increase. The push for increased energy efficiency will also lead to increased demand for energy auditors and the first step to efficiency is conducting an energy audit to see what measures can be done and what needs to be replaced to make the home or business more energy efficient.

Certifications:

Analysis jobs are not entry level. Energy auditors need some background in building science to assess the energy consumption of the building. Some small retrofit contractors have successfully trained small home auditors from retrofit crew members.

Energy analysis positions often require certifications from the Building Performance Institute, the preeminent training, certification, and accreditation organization in building energy efficiency. In fact, participating contractors in NYSERDA building efficiency programs are required to have staff members certified by BPI, and NYSERDA reimburses the cost of BPI training and certification. Relevant BPI certifications include:⁴⁷

- Building analyst (for auditors of one- to four-unit residential buildings)—Training includes an overview of building science fundamentals, analysis of diagnostic equipment, and assessment of building tightness.
- Multifamily building analyst (for auditors of larger residential buildings)—Training for experienced energy auditors and building analysts to perform energy audit work in multifamily buildings.
- Building envelope specialist—Training includes building analyst courses, health and safety, indoor air quality, and advanced blower door applications and other topics related to building envelope efficiency.

Other energy analyst certifications include:

- Certified Energy Manager.
- Certified Energy Auditor.
- Energy Manager in Training.
- High Performance Building Design Professional.
- New York State Energy Research and Development Authority Flex-Tech Provider.
- Certified Energy Specialist.
- Certified Energy Procurement Professional.

“New York’s future economic growth depends on our ability to generate leading ‘green industry’ businesses and a skilled, green-collar workforce.”

– Kathryn Wylde, president and CEO of the Partnership for NYC

Auditor training can be good preparation for a higher-level engineering career. Engineers are required to obtain an engineering degree, which is offered by most higher education institutions in New York City.

Training providers:

In New York City several organizations offer training programs for BPI certifications, notably:

- The Association for Energy Affordability is one of the major energy efficiency trainers in New York City and offers courses for BPI certifications, including multifamily building analyst, building analyst, and envelope specialist. AEA has provided training for small contractors, individuals, property maintenance companies, weatherization providers, city agencies, and unions, among other entities.



The nonprofit Community Environmental Center, or CEC, has performed weatherization services in metro New York City for over a decade. CEC works on approximately 200 one- to four-family homes each year for fee-for-service jobs as well as no-charge services under New York State's Weatherization Assistance program for low-income families.

A recent client was grateful for the help: "My children are now warmer on cold days, and the insulation keeps us cooler in hot weather. We could not have done this without your help. Keep up this wonderful service to help New York citizens."

Information provided by the Community Environmental Center

- The City University of New York Center for Sustainable Energy is a congressionally funded organization based at Bronx Community College. It offers courses for BPI certification in addition to their other programs at several CUNY campuses including the Borough of Manhattan Community College, LaGuardia Community College, Medgar Evers College, Kingsborough College, and the New York City College of Technology⁴⁸
- The Thomas Shortman Fund, SEIU Local 32BJ recently affiliated with BPI to provide certification training to its members.⁴⁹

Training gaps and needs:

- More venues for training.
- Greater publicity of BPI certification and existing training targeting jobseekers and contractors.
- More foundational skills programs—jobseekers should be referred to BPI trainings only after they've developed organizational, advanced math, and communication skills.
- A centralized referral mechanism linking preliminary offsite training to contractors.

Construction trades, weatherization, and heating, ventilation, and air conditioning jobs

Job titles: Boilermaker, carpenter (rough or construction), electrician, energy services and testing, adjusting, and balancing technician, glazier, sheet metal worker, insulation workers, floor, ceiling, and wall installer, pipe fitter, sheet metal worker, weatherization installers and technicians

Required skills:

- Advanced computer-software proficiency.
- Foundation in electrical systems.
- Construction trade skills.
- Mechanical tools experience.
- High school math background (or higher).
- Understanding of building science.
- Understanding of heating, ventilation, and air conditioning systems.
- Ability to lift heavy equipment/materials.
- Manual dexterity.
- Quality control analysis skills.

Position descriptions:

The construction work created by retrofits and energy efficiency upgrades—the physical alteration, installation, and repair of building structures and systems—requires a wide range of skills:

- Replacing boilers, windows, and lighting fixtures with newer energy efficient models.
- Installing air conditioning chillers.
- Improving indoor air circulation systems, including duct work, blowers, and fans.
- Improving building electrical systems, including installing light sensors and thermostat controls.
- Adding or replacing insulation, including insulating pipes.
- Caulking around windows and adding sweeps under doors to minimize heating and cooling loss.

Although job titles are not firmly fixed in this emerging area, retrofit work draws on a broad swath of the construction trades—for example, boilermakers, carpenters, and electricians. The specialized construction trades are currently responsible for the bulk of the more complex retrofit work in larger commercial, residential, and municipal buildings.

For example:

- Pipefitters and sheet metal workers install and upgrade heating, ventilation, and air conditioning, or HVAC systems and ductwork.
- Electricians replace motors, rewire electrical systems, and install light sensors and thermostat controls.
- Glaziers install energy efficient windows.
- Insulator mechanics and boilermakers install pipe insulation and replace or repair boilers.
- General construction laborers perform basic measures such as caulking and installing insulation and may perform other tasks on smaller, less complex energy efficiency projects.

Retrofit projects in small homes and buildings are very often performed by general construction crews rather than by specialists, because these retrofits are not as complex as large residential, commercial, and industrial projects.



Laborers' Local 10's Green Jobs Training Program

Local 10, a new affiliate of the Laborers' International Union of North America, or LiUNA!, specializes in residential energy efficiency and weatherization work. Through training and organizing, Local 10 works to create long-term careers and pathways out of poverty in communities most burdened by the dual problems of energy costs and climate change.

Local 10 recently started a Green Jobs Training Program for unemployed, underemployed, and disadvantaged workers. The program provides hands-on instruction in all of the major retrofit and weatherization areas—from caulking and sealing to conducting a home energy audit. Local 10 partnered with numerous community-based organizations throughout New York City to recruit for the program, and its participants reflect the city's invaluable diversity.

"I am proud that my union, LiUNA!, trained 22,000 members in NYC last year and two-thirds of them were people of color," says Andre Tanner, a graduate of the program.

Graduates have begun securing employment with union green companies. Tahlia Williams, pictured above, was recently hired by the Community Environmental Center, or CEC—the largest not-for-profit organization to provide energy conservation for low- and middle-income residents in New York State—and a Local 10 signatory company.

"Working with CEC will give me the opportunity to join a company that is committed to cleaning up the environment while at the same time helping our fellow residents conserve for a better outcome for our future and our kids future," says Ms. Williams. "The two things I can do to make a better life for my child are: have a good job and career, and help preserve the earth. Here I have the opportunity to do both."

In larger buildings workers with specialized knowledge of HVAC systems, such as HVAC apprentice technicians, are crucial to retrofit work because the upgrade and replacement of these systems is often the centerpiece of a retrofit project and has the biggest impact on reducing energy use.⁵⁰

Energy management covers several important areas, including:

- Commissioning and retrocommissioning: The assessment, testing, and balancing of building systems and controls when first installed in new or existing buildings (commissioning) or the periodic testing and balancing of existing building systems (retrocommissioning) to meet design, durability, and safety standards.
- Distributed generation: The installation of systems that generate electricity onsite, whether renewable (solar photovoltaic panels) or not (natural gas-powered cogeneration systems producing both steam and electricity, also known as combined heat and power.)
- Smart meters: The installation and monitoring of advanced electricity meters that display energy use and the price of power from minute to minute. They enable building operators to reduce energy use when it is most expensive under a utility real time pricing program where they can see the times when electricity demand is at its peak.
- Optimization: The installation of advanced control techniques to effectively manage how and when a facility uses energy. For example, an optimized ventilation system that only operates when it detects a low level of oxygen or a build up of toxic gas in the room.

In addition to the installation and monitoring of technology such as smart meters, effective energy management depends on long-term energy planning not only to reduce energy use, but also to capture related financial incentives. For example, several government and utility programs pay building owners to reduce their energy use overall or to shift their peak energy demand away from times when the electricity distribution grid is most overburdened and at risk of failure.⁵¹

Weatherization commonly refers to applying cost-effective energy efficiency measures for existing residential and multifamily housing with low-income residents.⁵² The Weatherization Assistance Program run by the Department of Energy finances most weatherization projects. The program focuses mainly on basic measures such as caulking, insulation, door sweeps, and appliance replacement because it emphasizes a quick return on investment. For this reason weatherization technicians do not need the same level of specialized construction skill as workers on other retrofit projects.

Major employers:

Home performance contractors

These companies perform retrofits for residential buildings with one to four units and encompass HVAC, plumbing, insulation, electrical wiring, and other improvements. Many general construction companies can perform components of retrofit work, but companies that are qualified to perform complete audits and retrofits under programs such as the New York State Energy Research and Development Authority Home Performance with Energy Star have staff members certified by the Building Performance Institute.

There are over 15 BPI-certified home performance contractors in New York City, and that number is rising as NYSERDA expands efforts to recruit contractors into its programs by publicizing partial subsidies for employee training, among other benefits. This area generally offers great potential for existing renovation and small construction firms to expand their market.

The typical home performance contractor has fewer than 10 employees including an auditor, two- to five-person laborer crews, administrative staff, and marketing and outreach personnel—often just the company principal.

Small home energy auditors often double as the principals of home performance and renovation companies, whereas multifamily analysts primarily work for large engineering firms.

Large energy efficiency engineering firms

These firms perform audits and retrofits for multifamily residential, commercial, and municipal buildings, and they commission and retrocommission building systems. Many are partners in the NYSERDA Multifamily Performance Program or the NYSERDA Flex-Tech Program geared toward industrial properties. Large energy efficiency engineering firms are also responsible for the energy efficiency projects commissioned by the Department of Citywide Administrative Services' Office of Energy Conservation. These are projects designed to meet the city's goal of reducing municipal greenhouse gas emissions 30 percent by 2017, as per the city's Climate Protection Act.

Most of the large firms have more than 50 employees, including engineers, auditors, administrative staff, marketing and customer outreach personnel, and industry development staff.

Weatherization nonprofits

Weatherization nonprofits perform audits and retrofits for buildings with low-income owners or tenants under the federal Weatherization Assistance Program.

A weatherization contractor's employee base is similar to a home performance contractor's and could include an auditor, two- to five-person laborer crews, administrative staff, and marketing and outreach personnel.

Demand:

The Weatherization Assistance Program received one of the largest budget increases in the American Recovery and Reinvestment Act. The total budget for the WAP program in New York went from \$71.9 million in 2008 to \$394 million in 2009.^{53 54} The increased allocation to New York State will expand weatherization's reach and potentially create demand for more workers who can install residential efficiency measures.

NYSERDA's programs are market transformational—they plan to encourage market participation until a tipping point is reached and public subsidies are no longer necessary. To this end, outreach is a crucial part of NYSERDA's mission. Experts have long noted that energy efficiency is an area where lack of basic awareness is a major hurdle to growth. Building owners are not always aware of the energy cost savings achieved by retrofits, and many contractors do not offer or market these services.

NYSERDA has committed in recent months to transforming the downstate energy market by expanding staff and creating a new senior position in their New York City office. NYSERDA has particularly worked to increase program participation on both the consumer and service provider sides by offering increased incentives for contractor participation and expanding programs like the Energy \$mart Communities Coordinator Program, a series of community-based education and public outreach efforts aimed at increasing awareness of energy efficiency and renewable energy services and products mainly in low-income areas.

Both contractor and homeowner participation in the building efficiency programs has increased significantly since the program has begun. However, many program partners in the multifamily retrofit program have indicated that since the economic downturn, some building owners have commissioned energy reduction plans but not implemented them.

Construction has arguably been the industry hardest hit by the economic downturn in New York City. The New York Building Congress estimates that the city could lose almost 30,000 construction jobs by 2010. According to a New York City construction group the city has already lost about 20,000 construction jobs since August of 2008.⁵⁵ These figures—bleak as they are—do not even take into account the thousands of laid-off undocumented and misclassified workers operating in the city's underground construction field.

The emerging green economy presents enormous opportunities for the construction industry's workforce. Many jobs in the sustainable energy sector—specifically those involving building retrofits, energy management system installation, and renewable technology installation—are either existing or retooled construction trade occupations. Most building retrofits, for example, require some set of electrical, plumbing, carpentry, insulation, roofing, and HVAC skills.

Larger industrial, commercial, and municipal building retrofits directly employ licensed electricians, insulators, steamfitters, plumbers, boiler mechanics, carpenters, and laborers. The growth of energy efficiency work in the small home market will demand a new cadre of workers with a wide array of basic construction skills, from window replacement to wall insulation. Large-scale renewable energy projects, smart meters, distributed generation plants, and other energy management systems also demand licensed electricians, carpenters, laborers, steamfitters, pipefitters, glaziers, and plumbers for proper construction and installation.

Data indicate that construction-related jobs in the energy sector are already in demand or will be soon. The Louis Berger Group, an engineering consulting firm, estimates that more than 422,000 direct jobs (in person years) will be created by the set of climate change-related energy initiatives outlined in PlaNYC, including the 2009 Green Building Legislation. Many of these jobs will be in the construction field or will require retooled construction trade positions.⁵⁶

The State Energy Efficiency Portfolio Standard, which requires 15 percent of New York State's reduction in electricity use to come from efficiency is also projected to create more than 51,000 jobs (in person years) over the next three years, the majority being construction trade jobs. In each of these years, the EEPS is expected to create 480 construction managers; 1,277 construction laborers; 2,778 electricians; 1,961 plumbers, pipefitters, and steamfitters; 666 operating engineers; and 380 construction trade helpers.⁵⁷

Finally, according to the New York State Department of Labor, several energy-related construction job titles have a "very favorable" occupational outlook in New York City. The New York State DOL anticipates over 1,100 openings for electricians, plumbers, pipefitters, and steamfitters by 2011.

Other green sectors will also provide opportunities for the construction trades. Brownfield remediation, destination park completion, and mass transit capital projects are all key components of the construction industry's portfolio. If the city, state, and federal governments continue to invest in these areas of the green economy numerous construction jobs will be retained and created.

Certifications:

Much retrofit work does not require any new green certifications. Construction trade workers employed on a large-scale municipal retrofit, for example, usually must be certified by a New York State-recognized apprenticeship training program. A construction worker who has been through a certified apprentice program has the fundamental occupational skills that underlie energy efficient practices. Many labor unions are also now incorporating specific training on green materials and techniques into their programs.

At the smaller end of the market, especially for one- to four-family home retrofits and for weatherization projects, workers require fewer specialized construction trade skills. Many local nonprofits performing retrofits under the Weatherization Assistance Program train entry-level workers on the job and give them familiarity with construction skills and experience with retrofit technologies. With greater and more specialized training these crew members can go on to pursue energy analysis certifications and auditor jobs.

Data indicate that construction-related jobs in the energy sector are already in demand or will be soon.

As the field continues to grow and mature, however, a number of stakeholders related to the energy efficiency industry have expressed an interest in developing industry-based standards for proper training and streamlined oversight of retrofit construction work.

Although not required, the following certifications and training programs prepare workers for occupations in the building retrofit field and teach the skills and proficiencies necessary to perform an effective energy efficiency upgrade.

- **Building Performance Institute certifications:** BPI offers several certifications for retrofit work, including heating professional, air conditioning professional, and heat pump professional for small homes, and multifamily hydronic heating system design professional and multifamily advanced heating plant technician for larger residential buildings. BPI certification is required for NYSERDA-approved contractors.⁵⁸
- **Bronx Community College's associate's degree in applied science in energy services technology:** This degree was launched in 2008 and verifies proficiency in construction and engineering; building and equipment management; heating, ventilation, and air conditioning systems; and contracting—among other areas pertinent to energy efficiency work. Graduates of this program have the hands-on skills and building systems knowledge to upgrade energy systems, perform HVAC work, and complete many other weatherization and retrofit tasks. This degree can also serve as a foundation for more advanced engineering and energy service degrees.
- **Environmental Protection Agency refrigerant certification:** This certifies HVAC workers to install, operate, and repair HVAC systems using EPA standards.⁵⁹ It is offered by several organizations in New York City, such as the Aci Environmental Safety Training Institute.⁶⁰
- **HVAC Excellence:** A nonprofit focused on providing ongoing training for experienced HVAC workers so they can obtain certifications they need to perform more complex work. Certifications cover areas such as residential air conditioning, light commercial refrigeration, heat pump installation, green awareness, and combustion analysis.⁶¹
- **North American Technician Excellence:** NATE is a nationally recognized standard of proficiency for HVAC professionals. HVAC technicians who are tested and certified by NATE have achieved the highest level of knowledge and mastery of HVAC technology and issues as recognized by industry partners, including American Society of Heating, Refrigerating, and Air-conditioning Engineers, the Building Performance Institute, and US Environmental Protection Agency.⁶²
- **Air Conditioning Contractors of America:** A group of over 4,000 air conditioning contractors that provides legal, technical, and business advice to contractors and lobbies for contracting business interests in Washington, D.C. It trains participants in system design and HVAC essentials and prepares and administers the tests for the EPA refrigerant certification and the North American Technician Excellence certification.⁶³

- United Association (of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada): Offers certification programs in valve repair, medical gas installation, welding, refrigerant handling, industrial rigging, and green awareness.⁶⁴

Training providers:

- The Association for Energy Affordability offers classes to employees of subgrantees of the Weatherization Assistance Program and their subcontractors. Once trained, employees work for weatherization agencies and organizations throughout New York City.⁶⁵
- Baruch College offers training and certifications in construction management, facilities management, and sustainability.⁶⁶
- CUNY Center for Sustainable Energy (see above).
- BPI training providers (see above).
- Laborers Local 55 partnered with the City of Newark and the Garden State Alliance for a New Economy to create a weatherization program in Newark that trains and employs residents in performing weatherization work.⁶⁷

Training gap and needs:

- Greater coordination between construction trades training courses and the retrofit market
- More foundational skills programs—job seekers should first have a foundation in electrical systems, rudimentary construction skills, and experience with mechanical tools before being referred to weatherization and HVAC work.
- A centralized referral mechanism linking preliminary offsite training to contractors.

Energy efficient building maintenance jobs

Job titles: Engineer, general operations manager, stationary engineers and boiler operators, maintenance and repair workers

Required skills:

- Advanced computer-software proficiency.
- Building operation skills.
- Advanced math skills.
- Strong organizational and management skills.
- Understanding of building science.
- Understanding of HVAC systems.
- Quality control analysis skills.
- Manual dexterity.



LEIGH PASQUAL, URBAN AGENDA

SEIU 32BJ Thomas Shortman Training Fund: One year, 1,000 green supers

Victor Nazario, superintendent of The Whitney Building in New York City, was a participant in the Thomas Shortman Training Fund's recent pilot program to train 1,000 green supers in one year. The fund, which offers training to 32BJ Service Employees International Union members, began teaching green courses in 2005 to help foster a greener New York City.

The 1,000 green supers program focuses on helping buildings cut costs, reduce energy use, and limit the damage to the environment by promoting sustainability through the people who can make a direct impact on improving energy efficiency in the city's buildings.

"While many of us were already doing some of this stuff, we didn't have the scientific vocabulary to understand why it was good to do it," said Victor, who has been a super for over 20 years. "What the program did was help us understand the purpose of it. This has inspired me to do even more to cut costs, and make my building healthier and safer."

Since completing the course, Victor says he has already approached his building's board with a number of recommendations. One of the first was to replace all of the incandescent bulbs in the building's public areas with compact fluorescents, and change light switches to motion sensor lighting. "Just by doing this, I think we might already be saving about 30 percent in energy costs," he said.

Position descriptions:

Energy efficient building maintenance is grounded in the existing knowledge of building personnel, including building cleaners, porters, maintenance workers, superintendents, and stationary and operating engineers. It encompasses the efficient maintenance and operation of heating, ventilation, and cooling systems; air pollution and boiler controls; cooling towers; and building water systems as well as appliance repair.

Energy-efficient building maintenance also overlaps with other sustainable facility maintenance practices such as green cleaning product use and recycling, since these practices often fall under the purview of the same building personnel responsible for systems operation and maintenance.

Resident managers oversee the maintenance and operations of multifamily residential buildings, and they maintain peak energy and water efficiency as well as occupant health by:

- Scheduling and coordinating necessary repairs, and the testing and balancing—commissioning and retrocommissioning—of building systems by outside experts.
- Communicating with maintenance staff to identify patterns in energy use and proposing building-wide solutions.
- Identifying incentive programs, such as those operated by NYSERDA, which can fund building upgrades.

Resident managers should ideally have an extensive background in building systems including plumbing, electricity, HVAC, and appliance repair, and they should possess general understanding of environmental issues.

Stationary engineers are advanced building personnel who work in a wide range of large facilities including commercial, residential, and municipal buildings and are responsible for:

- Monitoring building systems and controls.
- Keeping track of daily equipment maintenance activities.
- Initiating appropriate action when a building system is not operating efficiently or safely.

Stationary engineers are typically licensed to monitor and operate building mechanical systems such as boilers and steam turbines, and auxiliary equipment such as air compressors and refrigeration machinery. They should also have strong knowledge of building automation systems, which are computerized networks designed to monitor and control a building's mechanical and lighting infrastructure.

With the growth in energy efficiency investments stationary, engineers increasingly have a background in emerging energy management technologies such as distributed generation systems.

General building maintenance personnel—superintendents, porters, and doormen, for example—are equipped to track energy and water usage and are thus an integral part of

lowering a building's energy use and cooperating with building engineering staff. Many of these personnel also are experienced in basic HVAC maintenance, insulation, and increasingly alternative energy systems and emerging green technologies.

Major employers:

Employers in this subsector include building management companies and building owners. In public buildings the energy efficiency maintenance workers are employed by the City of New York.

Demand:

Energy-efficient building maintenance is grounded in the existing skills of building maintenance personnel and includes existing positions. As building owners place greater emphasis on energy cost savings, the skills involved are expanding and trained building maintenance and operations personnel are increasingly demanded. Municipal policies—such as the Greener, Greater Buildings legislative package—will also increase demand for properly trained building maintenance personnel who are familiar with energy efficiency measures.

Certifications:

- Building Performance Institute Energy Efficient Building Operations Specialist.
- Associate's degree in environmental control technology: Provides students with the theory, technical skills, and problem-solving skills needed to work in the HVAC and refrigeration industry. People can earn this degree at the New York City College of Technology.⁶⁸
- Bachelor's degree in environmental control technology: Expands the associate's degree and includes facilities management in the curriculum. People can similarly earn this degree at the New York City College of Technology.⁶⁹
- Building Owners and Management Institute certifications for:
 - Facilities Management Administrator: Trains people in the maintenance and operation of a facility and building systems, including the maximization of building efficiency and cost effectiveness.
 - Systems Maintenance Technician: Teaches key building principles, including energy efficiency, water treatment, HVAC, plumbing, and other building systems.⁷⁰
- Certified Indoor Air Quality Professional: Gives professionals the theory and skills to perform indoor air quality analyses, design, installation, operation, and repairs. This certification goes by various names and is granted by many different indoor air quality-oriented organizations such as the Association for Energy Engineers in Georgia and the national American Indoor Air Quality Council.^{71 72}

- New York City Department of Housing Preservation and Development's Superintendent Certificate: Makes sure building superintendents are trained in such disciplines as carpentry, electricity, plumbing, air pollution control, integrated pest management, and lead safe work practices among other topics beyond what is required to know by law. This certification helps superintendents secure positions in higher-end buildings and obtain career advancements.⁷³
- New York City Fire Department certifications for:
 - Fitness in Low Pressure Oil Boiler: Gives professionals competence in operating and supervising a low pressure oil boiler.⁷⁴
 - Fire Safety Director: Trains people to become fire safety directors in hotels and office buildings. Fire safety directors implement the fire safety plan of the building, direct evacuations, liaise for the fire department, perform inspections, conduct fire drills, and perform many other duties.⁷⁵
 - Standpipe and Sprinkler Operation: Verifies that professionals are familiar and have worked with the fire prevention system that they are going to supervise and maintain.⁷⁶

Training providers:

- The Edward J. Malloy Initiative for Construction Skills pre-apprenticeship training prepares New York City public high school seniors to enter the unionized construction industry. Students receive an introduction to building and construction trades as well as health, safety, and math lessons. Graduates directly enter a union apprenticeship without undergoing a public recruitment process.⁷⁷
- Baruch College offers training and certifications in construction management, facilities management, and sustainability.⁷⁸
- The Steven L. Newman Real Estate Institute's Certificate Program allows individuals preparing to enter the real estate industry to enroll in the program to learn technical real estate practices and related subjects such as finance, brokerage, development, marketing, law, and relevant computer software. The program helps students determine their specific career track within the industry and provides career counseling and opportunities for internships in New York real estate firms.⁷⁹
- The City University of New York Building Performance Lab conducts research and provides a practice-oriented education to students on energy efficiency and other components of building sustainability.⁸⁰
- The CUNY New York City College of Technology offers an associate's degree and bachelor's degree in environmental control technology.

- The International Union of Operating Engineers Local 94 coordinates an online training program that offers its members advanced training in building operation subjects such as air quality, environmental control, electrical power systems, and computer-controlled buildings. Local 94 trains for several certifications including the Building Owners and Management Institute's Systems Maintenance Technician and Systems Maintenance Administrator, EPA's Refrigerant Handler, and FDNY's Refrigeration Equipment Operator, Smoke Detector, and Air Compressor.⁸¹
- The Service Employees International Union's 32BJ's Thomas Shortman Training Fund has several courses for its members to learn skills for green building maintenance.⁸²

Training gaps and needs:

- Provide training and certification to incumbent workers in small to midsize buildings
- Expand retrocommissioning training for incumbent workers.
- Ensure workforce is prepared to realize New York City's revised energy and building codes and sustainability goals (30 percent emissions reduction target by 2030.)
- Create training tracks to funnel workers with a background in building science to auditing and envelope specialist work.

Renewable energy jobs

Job titles: Solar photovoltaic installer

Required skills:

- Basic construction skills.
- Foundation in electrical systems.
- Mechanical tools experience.
- Ability to lift heavy equipment and materials.
- Manual dexterity.

Position descriptions:

The development, marketing, and installation of renewable energy technologies generally demand a wide range of work including:

- Construction trades to install solar panels on roofs or construct wind turbine towers.
- Manufacturers to make and assemble the components of renewable systems, such as the mechanical parts of a wind turbine or polysilicon solar cells in solar panels.
- Operators to run and maintain renewable systems.
- Engineers.
- Sales and account managers.
- Energy consultants.
- Industry advocates.

A solar photovoltaic installer sets up solar panel arrays on rooftops and other surfaces.

This person:

- Works closely with the customer to determine energy and system siting needs.
- Reviews the project design, site conditions, and verifies the design during installation.
- Installs solar panels at the site, ensuring roof integrity and safety.
- Performs electrical wiring work to connect the solar panel array to the building electricity distribution system and meters.
- Ensures that installations meet all code requirements pertaining to solar photovoltaics.

New York City is particularly well suited to solar photovoltaic development because of its large amount of sunshine and high electricity costs.⁸³

Major employers:

Renewable energy installation and development companies are the major employers of solar photovoltaic installers. Renewable energy installation companies typically include installers, engineers, marketing professionals, and industry development personnel. A renewable energy development company would include scientists, engineers, business development professionals, and marketing professionals.

Demand:

The demand for renewable energy production will only increase, as the market drivers section explained. The demand for trained workers in solar installation and maintenance will increase with the increased demand for solar electricity.

Certifications:

North American Board of Certified Energy Practitioners Solar PV Installer Certification—This is a voluntary certification that allows PV installers to distinguish themselves from non-NABCEP certified competitors and to offer the certification as a credential and source of reliability to consumers. Being certified verifies that PV installers are competent in safety issues, site assessment, system design, electrical design, system inspection, and various other skills.⁸⁴

Training providers:

- The City University of New York Center for Sustainable Energy (see above).
- The Solar 1 Green Jobs Training Program features five tracks related to the emerging green economy: building performance; photovoltaic installation; deconstruction and materials recycling; green entrepreneurship; and horticulture, landscaping, and park maintenance.⁸⁵
- The International Brotherhood of Electrical Workers' Local 3 training program has several solar-related courses, including a solar photovoltaic theory and installation course.⁸⁶

Training gaps:

- Continue to expand training according to market drivers.
- Develop a construction trades training track that enables PV installers to access other green construction jobs such as licensed electrician and sheetmetal worker.

New York City is particularly well suited to solar photovoltaic development because of its large amount of sunshine and high electricity costs.

Urban Forestry

Parks work jobs

Job titles: City park worker, associate park service worker, climber and pruner, forestry conservation worker, agricultural technician or landscaping and urban gardening specialist

Required skills:

- Mechanical tools experience.
- Gardening and horticultural skills.
- Landscaping and design background.
- Strong organizational and management skills.
- Ability to lift heavy equipment and materials.
- Manual dexterity.

Position descriptions:

Parks work requires a wide range of physical, mechanical, and analytical work including:

- Pruning, cutting, fertilizing, and spraying trees.
- Operating shredding and chipping equipment.
- Loading debris and refuse onto trucks and hauling it away for disposal.
- Scheduling and supervising field surveys and inspections to assess trees' conditions and the extent of damage from insects and disease.
- Recommending solutions for species selection and site design.
- Assessing work to be done by contractors for tree removal, tree pruning, tree planting, and related forestry contracts.
- Compiling and managing street tree planting contracts.
- Inspecting and tagging trees at local nurseries.

Major employers:

Employers in this subsector include the New York City Department of Parks and Recreation, the borough Botanical Gardens, and private nonprofits that have partnered with the city on the upkeep of parks, such as the New York Restoration Project.

Demand:

With over 150 parks and playgrounds, 600,000 street trees, almost 3,000 GreenStreets, and a number of initiatives to plant new trees and expand park acreage already underway in New York City, this subsector accounts for a growing number of jobs in both the public and private sectors.

Certifications:

- New York Botanical Garden's diploma in horticulture: People with prior horticultural experience can earn the diploma by participating in a two-year, full-time program that teaches students botany, math, soil sciences, pest management, landscape design, and



PENNY MATTA

Sustainable South Bronx: Bronx Environmental Stewardship Training

In 2003, Penny Matta made a decision that changed her life. A 32-year-old mother of three, Penny was on public assistance and working part time to make ends meet. But when her children entered school full time, Penny wanted more: a real job and a solid career for her children and herself.

A friend referred Penny to Sustainable South Bronx, a community organization running a program called BEST—Bronx Environmental Stewardship Training—which offers job training for green careers. Penny said that she was attracted to BEST as a program that could actually lead to employment, a rarity in such programs.

“The training was tough at first, especially since I’ve never been an outdoor person,” said Penny. “But it soon became an adventure, and most importantly, it gave me independence and confidence.”

As a result of the BEST program, Penny is now a union employee with a city job, with full benefits for her family. After graduating, she got a job with the Bronx River Alliance Conservation Team, a project of the New York City Parks Department. After three years as a crew member, Penny was promoted to assistant crew supervisor. She is now an assistant crew supervisor with the New York City Parks Department.

plant propagation among other skills. The program offers classes, group projects, plant walks, work rotation, and fieldtrips.⁸⁷

- Civil Service Exam: The city fills many of its positions, including positions within the Parks Department, through the civil service process, which includes the civil service exam.⁸⁸
- Trade school, technical school, vocational high school, or associate’s degree
- Master’s degree in forestry

Training providers:

- The New York City Department of Parks and Recreation and the New York Restoration Project's MillionTrees NYC Training Program: provides jobs to youth that will help maintain and steward newly planted trees.⁸⁹
- Sustainable South Bronx's BEST program: BEST is one of the nation's first and most successful green-collar job training and placement programs designed to specifically benefit low-income and disadvantaged minority communities. Almost all of its students have been on public assistance and half have prison records. BEST graduates have certifications in various green sectors such as green roof installation, horticulture, operation of machinery operation, and various others. They also receive education on environmental justice issues and learn to promote equitable practices in their sustainability work.⁹⁰
- Youth Ministries for Peace and Justice's Greenternship program: offers training and apprenticeships to youth members in various green job sectors such as stormwater management, gardening, urban forestry, and streetscape beautification.⁹¹

Training gaps:

- Develop more on-the-job climbing, and pruning, and arborist training.
- Expand hands-on opportunities in tree and shrub climbing, pruning, bracing, cutting, and felling.

Green roof jobs

Job titles: Green roof installer, green roof professional.

Required skills:

- Basic construction skills.
- Gardening and horticultural skills.
- Landscaping and design background.
- High school math.
- Manual dexterity.

Position descriptions:

Green roof work encompasses the design, installation, and maintenance of roof vegetation, the production of green roof materials—including waterproof membranes, the special lightweight growing medium, planter units, and seedlings—and sales and marketing

The green roof installer and professional positions:

- Install, plant, weed, prune, or oversee installation of shrubbery and trees.
- Perform nursery runs to purchase plants.
- Present design ideas to principals and clients.
- Identify a wide range of trees, shrubs, and perennials suitable for Northeastern conditions and specifically for rooftops and terraces.
- Possess knowledge of fertilizer use with an emphasis on organic methods.

- Estimate project costs.
- Integrate principles of design and aesthetic sensibility into green roof projects.

Major employers:

Employers include green roof installation companies, landscaping companies, and roofing contractors. Community-based organizations such as the Sustainable South Bronx are also starting green roof installation companies. The SmartRoofs, LLC organization started by Sustainable South Bronx consults on, installs, and maintains green roofs for homeowners across New York City.⁹²

Demand:

The demand for green roofs was hampered by this year's economic downfall. However, as concerns over climate change increase green roofs offer substantial benefits and demand can be expected to increase in the coming years.

Certifications:

- Green Roofs for Healthy Cities.
- Leadership in Energy and Environmental Design accreditation.
- Accredited degrees in architecture, landscape architecture, civil engineering, drafting, landscape contracting, and real estate development

Training providers:

- The CUNY New York City College of Technology offers a lecture series titled, "Anatomy of a Brownstone" that frequently covers sustainable design topics such as green roofs, energy audits, whole house design, and sustainable building products.⁹³
- Sustainable South Bronx's Environmental Stewardship Training Academy program trains workers in green roof installation and maintenance. The SmartRoofs, LLC organization started by Sustainable South Bronx consults on, installs, and maintains green roofs for homeowners across New York City.⁹⁴

Training gaps and needs:

- Integrate green roof content into architecture, engineering, and design degree programs.

Transportation

Metropolitan Transit Authority jobs

Job titles: Bus maintainer, bus drivers, transit and intercity, rail track laying and maintenance, equipment operators

Required skills:

- Electrical systems foundation.
- Construction trade skills.

- Mechanical tools experience.
- Ability to lift heavy equipment and materials.
- Quality control analysis skills.
- Manual dexterity.

Position descriptions:

Transportation positions include the maintenance, repair, operation, alteration, and monitoring of mass transit vehicles, equipment, and infrastructure including subway cars, busses, rail switching systems, and track equipment.

Mass transit covers a wide spectrum of work, including administration of the transit authority, operation, maintenance, dispatch, drivers, customer service agents, and construction and improvement of stations, tracks, trains, ferries, and buses.

Major employers:

Employers in this subsector include the Metropolitan Transit Authority, the Port Authority, and independent transit companies.

Demand:

As previously noted transportation—particularly public transportation—does not have the same demand or market drivers as other areas. Demand for transit workers will depend on system size and upgrade. However, as the push for decreasing greenhouse gases increases, public transportation use and availability must increase to get cars off the road and greenhouse gases reduced.

Certifications:

- Civil service exam.
- High school diploma or completion of GED.
- Trade school, technical school, vocational high school, or associate's degree.
- New York State Class B Commercial Driver's License.

Training providers:

The Transit Workers United Local 100 training fund provides members with training, retraining, and skills upgrades.⁹⁵ TWU's training program includes pre-apprenticeship and apprenticeship programs.

Training gaps:

Many other green-collar positions develop the skills and work experiences necessary to secure an advanced civil service job with the Metropolitan Transit Authority. Creating paths between mass transit jobs and energy efficient building maintenance, building retrofits, hybrid vehicle maintenance, and even brownfield remediation can foster long-term green-collar careers.

Green product development

Deconstruction jobs

Job titles: Deconstruction worker, which includes laborers and freight, stock, and material movers, hand

Required skills:

- Basic construction skills.
- Mechanical tools experience.
- Waste handling and abatement skills.
- Ability to lift heavy equipment and materials.
- Manual dexterity.

Position descriptions:

- Remove and palletize ceiling tiles for shipment to recycler.
- Careful removal of cabinets and doors for reuse from interior renovations.
- De-nail lumber from construction sites for reuse.
- Salvage lumber, floors, doors, and other interior fixtures.
- Separate recyclable materials such as metal and clean lumber.

Work in deconstruction includes project management, forming business relationships between deconstruction companies and developers, developing contracts with government officials such as city engineers and planners, and the deconstruction labor itself. Deconstruction is well suited for workers in the construction trades because taking down and dismantling a building uses many of the same skills as putting up a building.

Major employers:

Deconstruction businesses often work with reuse companies to find a market for the reclaimed supplies. Rebuilder Source—a project of the Green Worker Cooperatives, which incubates worker-owned businesses—is a self-sustained cooperative in the South Bronx that reclaims materials and refurbishes them for reuse.⁹⁶

Demand:

The Deconstruction Institute highlights deconstruction practice across the country.⁹⁷ The interest and development of green buildings with attention to waste reduction will increase demand in deconstruction and reuse. Deconstruction can also revitalize dying neighborhoods in a way that demolition cannot.⁹⁸

Certifications:

Deconstruction uses all the skills needed for construction. Therefore, construction certifications would directly apply to deconstruction work.

Deconstruction is well suited for workers in the construction trades because taking down and dismantling a building uses many of the same skills as putting up a building.

Training providers:

- Build it Green! NYC trains and employs deconstruction workers in various deconstruction projects it has been contracted to do throughout the city.⁹⁹
- International Union of Operating Engineers (see earlier reference under the “energy efficiency building maintenance training providers” section).
- Laborers Local 78 offers programs that train members in lead abatement, scaffold work, asbestos handling, computer skills, and defensive driving.¹⁰⁰

Training gaps and needs:

The existing workforce training system already prepares workers for similar work—for example, demolition and brownfield remediation. Current training programs need to be augmented to forge a deconstruction training track and to retrain incumbent operating engineers, hazardous waste handlers, and demolition laborers.

Reuse, recycling, and green manufacturing jobs

Job titles: Team assemblers, electrical and electronic assemblers, engine and other machine assemblers, refuse and recyclable materials collectors or recycling and reclamation workers, office furniture refurbishers, recycling coordinators

Required skills:

- Basic construction skills.
- Mechanical tools experience.
- Strong organizational and management skills.
- Ability to lift heavy equipment and materials.
- Quality control analysis skills.
- Manual dexterity.

Positions descriptions:

- Operate agitators, shakers, conveyors, pumps, or centrifuge machines.
- Measure or weigh materials to be refined, mixed, transferred, stored, or processed.
- Clean and sterilize tanks, screens, inflow pipes, production areas, and equipment.
- Collect samples of materials or products for laboratory analysis.
- Maintain logs of instrument readings, test results, and shift production.
- Collect and sort reusable inventory.
- Catalog drop-offs and donations.
- Oversee and coordinate product and material distribution.
- Set up, operate, or tend machines to saw, cut, shear, slit, punch, crimp, notch, bend, or straighten materials.

Green manufacturing work includes engineering more energy efficient machinery, sourcing nontoxic materials and post-consumer recycled content, sourcing local materials, developing more efficient and energy efficient distribution methods, and increasing demand for green products through marketing.

Reuse subsector work includes identifying prime communities from which reusable materials can be gathered (sourcing) and prime communities that would benefit from receiving reusable materials, establishing and managing collection centers or programs, and organizing educational campaigns.

Recycling subsector work includes collecting and reprocessing recyclable materials, establishing and managing recycling centers, organizing educational campaigns, and researching and developing new recycling technologies that yield more raw materials per unit recycled and that can recycle more types of materials—for example, a wider range of plastics.

Remanufacturing work includes forming relationships with businesses and consumers to ensure the consistent reacquisition of old equipment, operating a disassembling and recovery business, and operating a remanufacturing business.

Major employers:

Employers in the green product development and manufacturing sector include manufacturers, reuse organizations, deconstruction (demolition) contractors, remanufacturing companies, recycling companies, and municipal agencies. Nonprofits and community-based organizations also run reuse centers.

Demand:

Deconstruction and reuse go hand in hand. As more emphasis is placed on reusing building and construction materials the demand for reuse and recycling will increase.

Certifications:

- Skills development certificate.
- High school diploma.

Training providers:

Green Office Systems trains and employs installers, carpenters, electricians, upholsterers, planners, designers, and managers to reuse and recycle high-end furniture and to design, build, and install sustainable office furniture.¹⁰¹

Environmental remediation

Brownfield remediation jobs

Job titles: Hazardous materials remover workers and hazardous materials handlers

Required skills:

- Construction trade skills.
- Mechanical tools experience.



BuildingWorks

BuildingWorks is a 17-week pre-apprenticeship training program, operated in partnership with the NYC District Council of Carpenters. The program focuses on job readiness, environmental remediation, basic construction skills, and workplace health and safety and recruits from New York's lowest-income neighborhoods through arrangements with leading community-based organizations. The graduation rate is about 80 percent with an 80 to 85 percent job placement rate, principally in union-based construction and hazardous waste-brownfield remediation jobs.

Jose Rivera (at left): "Before the BuildingWorks program, I had few skills and little hope for a career-track job. After 17 weeks, I was ready to enter many different apprenticeships and the program helped me get into the Electricians. Today, I am a Local 3 union electrical apprentice, earning a good wage and excellent benefits, supporting my family, and attending college at Empire State College."

- Waste handling and abatement skills.
- Ability to lift heavy equipment and materials.
- Manual dexterity.

Position descriptions:

- Remove asbestos and/or lead from surfaces using hand and power tools such as scrapers, vacuums, and high-pressure sprayers.
- Operate machines and equipment to remove, package, store, or transport loads of waste materials.
- Apply chemical compounds to lead-based paint.
- Construct scaffolding or build containment areas prior to beginning abatement or decontamination work.

Brownfields are industrial land sites polluted with lead, asbestos, and other contaminants. Brownfield remediation entails the removal of ignitable, corrosive, reactive, or toxic materi-

als from brownfield sites. Brownfield remediation creates new green and recreational spaces while increasing the local tax base and providing jobs. The Environmental Protection Agency's Brownfields Program has created over 25,000 new jobs since its inception.

Major employers:

Brownfield remediation work is done by for-profit and nonprofit developers, landowners, local development organizations, and community groups. The same employers can also do redevelopment work.

Demand:

New York State offers a tax credit for reclamation and redevelopment of brownfields in the state, which encourages organizations to get involved in cleanup.¹⁰² Also, population increases and scarcer land will push the reclamation and redevelopment of brownfields. In New York City alone there are an estimated 7,600 acres of brownfield land that offer great potential for redevelopment and job creation in this area.¹⁰³

Certifications:

- Construction trades apprenticeship.
- Occupational Safety and Health Administration 10 Site Safety certification.
- Occupational Safety and Health Administration 40 Hazardous Waste Operations certification.
- High school diploma.

Training providers:

- Ando International, an environmental training and consulting organization, offers training in asbestos handling, air quality sampling, hazardous materials, lead, silica, Occupational Safety and Health Administration regulations, and mold remediation.¹⁰⁴
- Building Works, a partnership between the Brooklyn Workforce Innovations and the New York City District Council of Carpenters, is a pre-apprenticeship program in construction and environmental remediation. The program provides a thorough introduction to the building trades and the opportunity to earn 13 combined licenses and certificates.¹⁰⁵
- Construction Skills 2000, also known as the Edward J. Malloy Initiative for Construction Skills, trains New York City public high school seniors to enter the unionized construction industry. Students receive an introduction to building and construction trades as well as health, safety, and math lessons. Graduates directly enter a union apprenticeship without undergoing a public recruitment process.¹⁰⁶
- The New York State Apprenticeship Program for the Building Trades provides apprenticeship programs in New York City in asbestos abatement, plumbing, and bricklaying.

In New York City
alone there are an
estimated 7,600 acres
of brownfield land.

- Nontraditional Employment for Women is a nonprofit organization that trains and prepares women for nontraditional careers in construction, utilities, and transportation industries. It offers hands-on shop skills, lectures, physical fitness assessment, job development, placement services, social service referrals, and case management.¹⁰⁷
- The St. Nicholas Neighborhood Preservation Corporation is a nonprofit community development corporation that offers an environmental remediation technician training program that helps prepare participants to secure up to 12 industry-recognized certificates in environmental remediation-related work.¹⁰⁸
- Support and Training Results in Valuable Employees is a nationally recognized workforce development organization that started in Flint, Michigan, and has expanded to New York City and London. It provides job training in manufacturing and construction industries.¹⁰⁹

Training gaps and needs:

Established remediation training infrastructure needs to be integrated with the emerging deconstruction field.

Recommendations to fill the gap between training needs and demands

The above section highlights the huge range of occupations that are growing due to new investments and interest in the green economy. Many of these occupations are not new, but they are newly serving the broader clean-energy agenda. Training for these jobs can often build on existing programs, but these programs will need to increase to serve an influx of students, and in some cases they may need to change to adjust to offer new skills and certifications.

In order to fill the gap between the current training infrastructure and the projected training demands, the roundtable proposes the following recommendations:

Expand existing programs

Expand Building Performance Institute training resources by:

- Expanding the capacity of current colleges offering BPI training.
- Identifying new colleges to offer BPI training.
- Financing a public awareness campaign to promote BPI certification.

Expand the MillionTrees NYC program with particular attention to vacant climber and pruner positions.

Expand Career and Technical Education School curricula by working with the New York State Department of Education to incorporate retrofit and building efficiency work into the curricula of construction-based CTE schools.

Increase interagency cooperation

Include retrofits in the requests for proposals process by pressing the city's Small Business Services to include energy efficiency and/or retrofits on its list of applicable sectors in the Workforce 1 requests for proposals process.

Develop green workforce training as part of the license process by working with the New York City Department of Consumer Affairs to develop a mandatory green workforce training as part of the Home Improvement Contractors License process.

Further develop industry-backed certifications by having the mayor task the Office of Recycling Outreach and Education to work with industry partners to develop industry-backed certifications in the deconstruction, recycling, and reuse subsectors.

Coordinate with the New York State Energy Research and Development Authority to create a training resource center with high-tech equipment and building analyst facilities to be utilized by multiple providers—for example the Hudson Valley Community College's TEC-SMART program. This center would further integrate and build the capacity of existing building analyst and renewable and energy efficiency training programs.

Address the training needs of incumbent workers

Identify strategies to transition out-of-work union workers—or benched workers—to building retrofit work by convening a Commission on Energy Efficiency Construction Work.

Monitor incumbent workers' skills and training to make sure they are prepared to realize revised energy and building codes and sustainability goals, as per the Climate Protection Act.

Incorporate green training requirements into incentive programs

Green training and employment requirements should be written into any incentive programs that support private sector energy efficiency and renewables.

Analyze the occupational health and safety of emerging industries

The city should commission a study on occupational health and safety training in emerging and unregulated green subsectors including renewable energy installation, home performance contracting and weatherization, and hybrid vehicle maintenance.

How New York City can demonstrate its commitment to green jobs training

The city must demonstrate its commitment to green jobs training through the following actions

- The Office of Long Term Planning and Sustainability should create a workforce development point person to monitor the workforce needs of PlaNYC initiatives as they are developed and implemented.
- The City Council should earmark funding to green the Jobs To Build On program, a program funded by the city council to assist those that are unemployed, underemployed, or just entering the workforce.
- The city should play a leading role and set an example by requiring green training where relevant to specific city job titles as a part of human resources policies for promotion and advancement.
- The Mayor's Office of Adult Education and the Mayor's Office of Sustainability and Long Term Planning should develop an adult education teaching curriculum on sustainability modeled after the successful implementation of the curriculum recently completed with the New York State Department of Health.
- The Human Resource Administration should develop a centralized on-line resource for green job training in the city and compile information on what types of certifications are available.

Good jobs/green jobs for a high-road green economy

The promise of the new green economy is that we can create good jobs and help make our built and natural environment more sustainable.¹¹⁰ This framework forces policymakers and advocates to rethink the idea of “sustainability.” Sustainability is not limited to environmental issues—it expands into much broader concepts of economic growth and social justice. Creating jobs that help our environment but push people deeper into poverty does not make our economy or society more sustainable. In fact, persistent poverty in the United States undermines environmental sustainability because low- and very-low income populations are often forced to use available fuel, food, water, and space in less “green” or efficient modes.

Policymakers and advocates need to recognize that the notion of sustainability must include the sustainability of individuals *within* the new green economy. Job standards are therefore fundamental to every job created within the new economy to ensure individual, economic, environmental, and societal sustainability.

Defining job standards

Roundtable participants determined that the job standards that should define environmentally and economically sustainable employment, as well as fairness and equity, encompass much more than just wage standards. They include:

- **Benefits:** Are employees given paid time off for vacation and/or sick leave? Are there other paid benefits such as pensions or health care?
- **Occupational health and safety:** Are employees working in a safe environment? Do they have the right to work with nontoxic and least-toxic materials? Are health and safety provisions enforced?
- **Legal requirements:** Do employers contribute to the proper programs such as Social Security and unemployment insurance? Are workers properly classified as exempt or nonexempt?
- **Training opportunities:** Do employees have opportunities to receive on-the-job training?

Persistent poverty undermines environmental sustainability because low- and very-low income populations are often forced to use available fuel, food, water, and space in less “green” or efficient modes.

- **Advancement opportunities:** Are employees able to move up a career ladder? Do they have professional development opportunities?
- **Wages:** Are employees paid at a level appropriate to their skills and work? Are their wages paid at a prevailing wage where applicable?
- **Work environment:** Are employees given a consistent schedule and consistent pay? Do they have the right to organize?

Answering the questions above provides the basis for job standards when they are coupled with wage standards that recognize the need for family-sustaining wages. The following section highlights best practices across key areas and provides examples for how to promote strong job standards.

New York City and job standards

New York City has a living wage ordinance that applies to roughly 50,000 employees of service contractors, principally health care workers, who are doing business with the city.¹¹¹ The living wage rate climbed to \$10.00 per hour in 2006. The number of workers, however, should be expanded to all companies receiving economic subsidies from the city. When the living wage ordinance was passed it excluded from coverage employees of major

Benefits of job standards to businesses and the economy

Strong job standards have been shown to have several benefits to workers, businesses, and communities

Strong job standards have been shown to:

- Promote the development of green businesses through:
 - Lower worker turnover
 - Lower long-term training and supervisory costs
 - Lower long-term health and medical costs and liability expenditures due to a safer working environment
- Enable the growth of the green economy through:
 - Decreasing worker misclassification, which reduces tax revenues
 - Paying higher wages, which generates greater consumer and tax revenues
 - Attracting a stable workforce base
- Leveling the playing field to foster the development of new and local businesses
- Building stable firms, which supports both market stability and innovation
- Complement the effort to transition to a green economy through:
 - Promoting the right to work with nontoxic and least toxic materials
 - Promoting the right to work on capital? projects that enhance local communities
 - Promoting work practices that lower the direct and indirect carbon footprints of projects, such as local employment
 - Promoting strong job standards will ensure that our economy is rebuilt equitably and sustainably.

corporations that receive taxpayer-funded grants and tax abatements under the city's economic development program, even though the coverage would have cost a fraction of 1 percent of annual revenue for those companies.¹¹²

The city should put in place standards that set definite requirements and metrics by which new jobs can be measured. This would guarantee that the future green jobs created are good jobs. And the benefit and use of public funds or incentives must be used as leverage for the creation of good jobs.

New York City can also take the lead nationwide by incorporating job standards into all existing sustainability initiatives. Currently, most sustainability initiatives are couched in terms of their environmental impact and fiscal benefit to the city. But too often the city does not measure the impact of subsidized developments on the immediate neighborhood or its residents. By incorporating job standards into sustainability initiatives New York City can begin reinforcing the notion that sustainability must include both the environmental benefit as well as the social benefit: good jobs, not just green jobs.

“...front-line workers in low-wage industries in Chicago, Los Angeles and New York City lose more than \$56.4 million per week as a result of employment and labor law violations.”

– From *“Broken Laws, Unprotected Workers: Violations of Employment and Labor Laws in America’s Cities”* by Annette Bernhardt and others

Integrating job standards and workforce development

Several cities and states have explicitly specified job standards in workforce development initiatives.

Wage standards: San Francisco's living wage programs

San Francisco, CA enacted a series of living wage policies covering city service contractors, home care workers, and virtually all the low-wage workers at San Francisco International Airport in 1999-2000.¹¹³ Studies on the policies' effectiveness indicated increased worker productivity, significantly reduced employee turnover, and a decrease in the number of people living in poverty.¹¹⁴

The San Francisco Quality Standards Program

The living wage ordinance in San Francisco explicitly extended to workers at the San Francisco International Airport, or SFO under the Quality Standards Program. The QSP affected roughly one-third of the 30,000 employees at SFO. Besides increased minimum wages the QSP included raised educational standards for new hires, training mandates intended to improve airport security and customer service, and a large-scale labor peace/card check agreement.¹¹⁵

In the first year of the program almost 90 percent of the ground-based nonmanagement workers—approximately 9,700—received a wage increase.¹¹⁶ For example, security screeners who averaged \$13,400 with no benefits before the QSP earned \$20,800 plus full benefits within the first year the program was implemented.¹¹⁷

The QSP also required employers to provide 12 paid days off a year or pay workers an extra \$1.25 per hour.¹¹⁸ Within the first year of QSP implementation employee turnover substantially decreased, and higher wages and better benefits improved worker performance.

What's more, the increase in wages, health benefits, leave, and employer-based taxes composed only 0.7 percent of airline revenues, which was mostly absorbed by the airlines. If the costs were passed on to consumers they would average \$1.42 per passenger.

The success of the QSP was a result of going beyond improving wages and benefits. The QSP addressed broader issues of employment standards and regulations and worker protection clauses. In this case strong job standards resulted in higher worker productivity, costs savings due to substantially decreased employee turnover, and increased standards for the workers with limited increases in costs to the employer.

San Francisco Home Care Workers Initiative

The effect of the living wage ordinance for home care workers in San Francisco is similarly impressive. After the ordinance was enacted, the wage rate of In Home Supportive Services home workers doubled in a 52-month period.¹¹⁹ In the same period:

- The number of In Home Supportive Services workers increased 53 percent.
- The number of consumers increased by 47 percent.
- The overall turnover rate of matches between consumers and providers fell 20 percent.
- The turnover rate of the workforce fell 30 percent.
- Every \$1 spent by the county on the initiatives brought an additional \$13 in income from state and federal sources to very poor San Francisco communities.

The San Francisco examples show that paying living wages and providing paid benefits to workers is beneficial to both workers and employers by resulting in higher productivity and decreased turnover with limited increases in costs to employers.

Incorporating family-sustaining wages and targeted outreach to disadvantaged communities: Washington State SB 5649

In the wake of receiving increased funds for energy efficiency through the American Recovery and Reinvestment Act, Washington State passed legislation ("the act") to invest \$14.5 million of stimulus money to help moderate-income homeowners, small businesses, and nonprofits retrofit their properties to become more energy efficient.

Beyond helping to make 100,000 buildings more energy efficient, the act guarantees veterans, members of the National Guard, and low-income and disadvantaged populations access to the new jobs that will be created by the retrofit program. The act links job-training programs that serve dislocated workers and historically marginalized communities with the newly created jobs.

The success of the QSP was a result of going beyond improving wages and benefits.

It establishes a pilot program, which among other things requires contractors to hire available workers trained from workforce training and apprenticeship programs, pay prevailing wages, and hire from the community in which the program is located.

The pilot programs receiving funding must provide semiannual reports to show their compliance with performance metrics. The performance metrics include the wage levels of the jobs created and the utilization of pre-apprentice and apprenticeship programs. Among the metrics that must be reported annually to the state legislature are the number and type of people trained through workforce trainings and apprenticeship programs and the number of veterans, National Guard, and low-income and disadvantaged populations employed by pilot programs.

The act also updates the state's current low-income weatherization programs and specifically states as one of its goals that it will “create family-wage jobs that may lead to careers in the construction trades or in the energy efficiency sectors.” The program also requires employment of workers trained in previously established workforce training and pre-apprentice programs if these workers are available. Finally, the legislation requires sponsors—the entity doing the weatherization—to pay prevailing wages, hire from the community in which the program is located, and create targeted employment opportunities for veterans, members of the National Guard, and low-income and disadvantaged populations.

Upholding green-collar occupational health and safety

Worker safety—including proper training, safe working conditions, the use of nontoxic materials, and proper enforcement channels—is fundamental to creating good, green-collar jobs. Some examples of occupational health and safety practices are listed below.

Holistic, task-oriented health and safety guidelines: The Oregon Solar Construction Safety Manual

The Oregon Solar Construction Safety Manual was developed to provide a top-to-bottom, task-oriented manual for those in the solar industry to work more safely. The manual addresses:

- General jobsite safety.
- Ladder safety.
- Lifting safety.
- Fall protection and jobsite trip hazards.
- Solar plumbing safety.
- Solar electrical safety.

The full text of the manual can be found [here](#).

“A truly sustainable environment must protect the health and safety of workers.”

– Joel Shufro, Executive Director,
New York Committee for Occupational
Safety and Health (NYCOSH)

Best practices for emerging industries: Wind generation construction best practice

In response to the growing demand for green energy, the American Society of Safety Engineers is developing new standards to protect the safety and health of workers involved in construction and demolition operations for wind generation and turbine facilities.¹²⁰

The standards will address:

- Working at heights.
- Mechanical assembly of large components.
- Medium voltage electrical safety.
- Working in exposed environments.

The standards are currently being developed and at the time of publication a subgroup had been formed to develop best practices and standards.

Monitoring the health of workers: Connecticut Department of Transportation Lead Health Protection Program

The Connecticut Department of Transportation adopted the Lead Health Protection Program to protect bridge and road repair workers who are at risk for exposure to lead and lead poisoning. The program incorporates protective measures into contracts in addition to the use of regulatory measures.¹²¹ The two principal elements of the program are:

- Detailed medical and environmental specifications—for example, medical examinations and industrial hygiene—for monitoring and reducing occupational lead exposures at bridge sites—these specifications are included in the construction contracts and are paid for by the Connecticut Department of Transportation under the terms of the contract.
- A centralized, statewide surveillance system to monitor blood lead levels in workers¹²²

The blood lead levels for the most highly exposed work categories have declined substantially since the program was adopted.¹²³

Legal requirements and enforcement mechanisms

Setting clear guidelines and procedures for contracting and procurement reduces confusion for both employers and workers. It also codifies the value and priority of advancing work with strong job standards. Along the same lines, incorporating an enforcement mechanism is fundamental to protecting job standards. Without enforcement mechanisms bad practices will simply continue unchecked.

Promoting responsible contracting: California AB 574, the Responsible Contracting Act

Like many states, local governments in California normally must select the “lowest responsible bidder” to perform public works contracts or to supply materials to public agencies.¹²⁴ The word “responsible” has rarely been defined and it is usually left up to indi-

Along the same lines, incorporating an enforcement mechanism is fundamental to protecting job standards. Without enforcement mechanisms bad practices will simply continue unchecked.

vidual agencies to determine standards. To address this, the California Legislature adopted AB 574,¹²⁵ the Responsible Contracting Act, which formally authorized prequalification programs based on specific criteria. Prequalification programs apply standards to potential contractors before bids can even be submitted.¹²⁶ The California law requires prequalification procedures:

- Use a “standardized questionnaire and financial statement in a form specified by the public entity” (Section 20101[a])
- Adopt and apply a uniform system of objectively rating bidders on the basis of the completed questionnaires and financial statements (Section 20101[b])
- Create an appeal procedure by which a contractor that is denied prequalification may seek a reversal of that determination (Section 20101[d])

The California Department of Industrial Relations created a model questionnaire that includes questions relating to:¹²⁷

- The financial health of the contractor.
- Whether the contractor has worker’s compensation insurance.
- Whether the contractor’s license been revoked at any time in the last five years.
- Whether at any time during the last five years the firm any of its owners or officers have been convicted of a crime involving the awarding of a contract of a government construction project, or the bidding or performance of a government contract.
- Whether the California Occupational Safety and Health Administration has cited and assessed penalties against the firm for any “serious,” “willful,” or “repeat” violations of its safety or health regulations in the past five years.

The prequalification process has been used throughout the state. For example, the California State University System requires prospective bidders on construction projects with an estimated cost of more than \$400,000 to submit a prequalification form.^{128,129}

The evaluation process includes review of the prospective bidder’s financial status, safety record, and experience with similar projects. Once approved, a contractor remains prequalified for one year and can bid for projects at any of the 23 CSU campuses, although specific projects can require additional qualifications.

Wage watchdog: New York State Wage Watch

New York Wage Watch, formed in January 2009, is a partnership between the New York State Department of Labor and interested community labor organizations that investigates labor violations committed by businesses.¹³⁰ Violations include subminimum wages, nonpayment of wages, failure to pay overtime, and tip stealing. Under the initiative, citizens belonging to participating organizations have formal power to hold “know your rights” trainings, educate employers about labor law compliance, and distribute literature to employees, while department officials investigate businesses in a specific neighborhood usually unannounced.

The pilot program will work with six programs in New York City and Long Island: El Centro del Immigrante in Staten Island; the Chinese Staff and Worker's Association; the Retail, Wholesale and Department Store Union; Make the Road New York; United Food and Commercial Workers Local 1500; and The Workplace Project in Long Island.

Monitoring labor rights: Worker Rights Consortium

The Workers Rights Consortium is an independent labor rights monitoring organization.¹³¹ It is exclusively supported by universities, colleges, and secondary schools that buy collegiate apparel and pay an annual fee of \$1,500 or a portion of their gross revenues from their apparel licensing programs. The consortium works with educational institutions to adopt a manufacturing code of conduct that is incorporated into all apparel licensee contracts, monitors the compliance of licensees, and helps violating licensees meet labor standards. It also operates a Worker Complaint Mechanism, which provides trainings for workers at collegiate apparel factories on their right to file a confidential complaint.¹³²

Job training opportunities

On-the-job training is fundamental to ensuring workers receive the training they need to perform their work properly and safely. Beyond on-the-job training, however, there should be an opportunity for community members and other potential employees to be trained so they are ready to fill future positions.

Community-involved development: Staples Community Benefits Agreement

Community benefits agreements are between developers and a coalition of community organizations and ensure affected residents share the benefits of major develop-



Steve Nathan, chief engineer of 7 World Trade Center, a LEED certified building, is a graduate of Local 94's green training program for building operators, which it developed with the US Green Building Council of New York.

ment.¹³³ The Community Benefits Agreement for building the Los Angeles Sports and Entertainment District development next to the Staples Center in Los Angeles was groundbreaking in many ways, one of which was the requirement for job readiness and first source hiring programs.¹³⁴

The Staples Community Benefits Agreement requires the developer to support a range of job readiness programs.¹³⁵ The ultimate goal of the training programs is to have a pool of newly trained, job-ready applicants from the local community ready to fill the jobs when the development arises. The coalition for the Staples agreement leveraged seed money to begin a pilot jobs training program for the lowest-income families living in the area. Currently, the Figueroa Corridor Community Jobs Program provides an economic survival class, English as a second language classes, and computer literacy classes to local residents who need pre-employment education and support.¹³⁶

Career advancement opportunities

A pathway out of poverty begins with labor market entry and continues with career growth and the opportunity to advance beyond entry-level wages and responsibilities. Programs that provide on-the-job training and individual capacity building help to create a vibrant, well-trained workforce.

Providing job training and career ladders: Los Angeles International Airport Community Benefits Agreement

The Los Angeles City Council passed a national precedent in community benefits agreements—a \$500 million plan to provide environmental and economic benefits to communities affected by the planned modernization of the Los Angeles International Airport. The agreement was born of discussions between the city, the Los Angeles World Airports agency, and over 20 community groups, environmental organizations, schools, and labor unions. The agreement includes economic development plans such as:

- **Job training program:** The Los Angeles World Airports Agency will provide \$3 million per year for five years beginning in fiscal year 2005-06—for a total of \$15 million—to fund job training for airport jobs, aviation-related jobs, and pre-apprenticeship programs. The program targets low-income individuals living in Project Impact Areas, special needs individuals, low-income individuals living in the city, and incumbent airport and aviation-related workers. It includes job readiness programs, skills development, career ladder programs, incumbent worker training, and other programs.
- **Work experience programs:** The Los Angeles World Airports Agency will provide work experience programs and target opportunities for placement in the programs to residents affected by the modernization project.

A pathway out of poverty begins with labor market entry and continues with career growth and the opportunity to advance beyond entry-level wages and responsibilities.

- **First source hiring program for airport jobs:** Targeted applicants will receive early access to available airport jobs, and employers will receive cost-free, prompt referrals of qualified and trained applicants. All airport contractors entering into a new, amended, or renewed project must go through the program. First-priority targeted applicants include low-income individuals living in the Project Impact Area and special needs individuals. Second priority targeted applicants include low-income individuals living in Los Angeles.

The Los Angeles World Airports Agency will apply the city's living wage ordinance and worker retention policy to all airport contractors, lessees, and licensees.

Creating a healthy and productive working environment

To realize the promise of the new inclusive green economy, we must rethink and reconceptualize how we approach work and working environments. A more holistic idea of sustainability that goes beyond the natural and built environment must also be applied to the workplace. A sustainable workplace addresses, among many considerations, the safety of all materials used, the health and safety of working conditions, the ability of workers to assert their rights and privileges, and the ability of workers to maintain a consistent and predictable work schedule. Project Labor Agreements are one way to ensure that projects maintain and adhere to these ideas.

Working with labor and employers: Project labor agreements

A project labor agreement is a form of pre-hire agreement entered into before any workers are employed.¹³⁷ It is project specific and lasts only as long as the project. By giving parties the ability to anticipate and avoid potential problems, project labor agreements maximize project stability, efficiency, and productivity and minimize risks and inconvenience. They



Lemar Tyrell, a porter with Rose Associates, using a green cleaning dilution station.

also provide job stability and standardize work schedules, apprentice-journey worker ratios, hours, and payment arrangements, resulting in greater cost efficiencies.

In New York State the use of project labor agreements for public works was first encouraged through an executive order during the Pataki administration and adopted by the succeeding Spitzer and Paterson administrations.¹³⁸ And recently President Barack Obama signed an executive order encouraging the use of project labor agreements for major federal public works projects.¹³⁹

The ability of PLAs to save time and money is highlighted in the analysis of the I-287 Westchester Expressway construction project north of New York City.¹⁴⁰ Entering into a PLA resulted in \$8.4 million in cost savings, including \$ 1.2 million saved in managed care programs, \$1.03 million saved through increases in the ration of apprentices,¹⁴¹ and \$ 3.27 million saved by standardizing eight holidays.

Along with the executive order on project labor agreements, two additional New York State executive orders issued in 1993 work to ensure fair labor standards and responsible contracting.¹⁴² Together, the three orders ensure that the “lowest responsible bidder” requirement for contracting agencies results in actually “responsible” contractors by including 12 areas for testing bidder compliance. The testing areas touch on a wide spectrum of practices, including safety practices, wage compliance, labor law violations, and any criminal environmental practices. They include:

- Grave disregard for the personal safety of employees, state personnel, or members of the public.
- Willful noncompliance with the prevailing wage and supplements payments.
- Any other significant labor law violations, including child labor violations, failure to pay wages, or unemployment insurance tax delinquencies.
- Any significant violation of the Worker’s Compensation Law, which provides workers injured on the job with monetary compensation.
- Any criminal conduct involving environmental practices.

By focusing on protecting workers and maximizing public funds the three executive orders work to create healthy, productive working environments that are more efficient and productive.

Recommendations for a high-road green economy

Government and public projects should never create or support poverty-level jobs. Low wage, “low-road” jobs put a double strain on the public treasury—these workers pay lower taxes than higher-paid employees, and they are also much more likely to require public assistance such as food stamps, health care, and housing assistance. City programs must

focus on creating well-paid, family-sustaining jobs. One way could be by fostering labor-business partnerships through dual-stakeholder forums in an effort to organize the city's emerging green sectors. Data show that union participation increases wages, benefits, and provides workers with safer working environments.¹⁴³ In addition, the city should:

Incorporate job standards into public projects

Incorporate job standards into PlaNYC projects

PlaNYC, the city's blueprint for achieving environmental sustainability, should explicitly incorporate wage, safety and health, local hiring, and local sourcing requirements and subcontractor provisions into all projects that advance its goals. Environmental sustainability must also include individual sustainability. Strong job standards bring individuals closer to sustainability by providing safe working environments and family sustaining wages and benefits. Further, local hiring and local sourcing would decrease the carbon footprints of projects by decreasing travel costs associated with the project.

Job standards can be incorporated into PlaNYC projects through an executive order from the mayor. Among the projects the executive order would cover are renewable energy pilot projects, destination park completions, or building retrofits, such as the Greener, Greater Buildings initiative.

Tie public incentives to job standards

As stated earlier, government and public projects should never create or support poverty-level jobs. Public investment in green industries and job growth and development, whether in the form of tax breaks, grants, tax-free financing, or subsidies agreements for businesses, must be tied to a living wage, and where applicable, prevailing wage jobs with standards. Requiring job standards does not make jurisdictions less business friendly. Currently, 89 jurisdictions across the country attached job-quality standards to at least one development subsidy without any negative impact on economic activity.¹⁴⁴

City-subsidized projects should engage in community-led development

Community-supported development goes beyond requiring a community benefits agreement. Working closely with community groups and interests makes for a more streamlined and efficient development process that is more transparent and accountable, promotes democratic planning principles, and has broad fiscal benefits. Community-led development ensures that community members also benefit from the development through local job creation, protection from any environmental hazards that may arise from the development, and long-term economic gain.

Establish task forces to make green jobs good jobs

Intergovernmental task force on green jobs standards

The city should convene an independent green job standards task force to secure job standards for workers and promote a common understanding of the scope and definition of standards among levels of government. The task force should include representatives from federal, state, and local agencies, such as the U.S. Department of Energy, the New York State Department of Housing and Community Renewal, the New York State Public Service Commission, the Mayor's Office of Long Term Planning and Sustainability, and advocates from community, environmental, and labor organizations.

Such a committee would allow policy and program coordination—to avoid contradictory work—as well as oversight and enforcement of job standards for green jobs.

Oversight committee on workplace safety and health

New York's City Council should establish an oversight committee that provides guidance on workplace safety and health and job hazard analysis. The committee should utilize applicable OSHA standards and other applicable regulatory requirements as well as best professional practices and guidance where legal standards do not exist or are outdated. It should include representatives from government, business, labor, and community-based organizations along with scientific and other experts.

Task force for third-party financiers

The City Council should create a task force to work with third-party financiers who fund energy efficiency or other green projects that aim to fulfill public mandates. The task force would make sure that private capital attached to the city's sustainability initiatives creates jobs with good wages, benefits, and opportunities for advancement

Data collection

Survey green businesses

The city should work with the Workforce Investment Board and the City University of New York Center for Urban Research to survey green businesses and engage them as part of the Labor Market Information System. The survey should help determine whether the jobs created from the city's growing green sector are good jobs. Sample questions should include:

- Did these jobs create pathways out of poverty?
- Who is getting the jobs?
- What level of job retention do the jobs have?
- Do people advance in the jobs?
- Is there a clear career path for workers in these jobs?
- Are businesses happy with their workforce?

Green pathways out of poverty: Overcoming employment barriers to build an inclusive green economy

For centuries the poorest communities have been the most negatively affected by the fossil fuel-based economy. In New York City, the South Bronx and East Harlem in Manhattan, two predominantly black and Latino neighborhoods, suffer the highest rates of asthma in the city. East Harlem leads the city at 170.2 asthma hospitalizations per 10,000 children in 2000. This is compared to the citywide average of 64 per 10,000 and the national average of 33.6 per 10,000 hospitalizations.¹⁴⁵

But at the same time many of these communities have depended on stalwarts of the pollution-based economy for economic sustenance, such power plants and waste-transfer stations. They have been given the no-win choice between jobs and health. The growing focus on tackling global warming and reducing fossil fuel use raises important questions. How will efforts to confront the climate crisis affect these communities? And can these efforts replace job opportunities that hurt communities with employment that improves their health and sustainability?

A focus on employment is crucial because the communities most burdened by pollution are also disproportionately burdened by unemployment and joblessness. Building green pathways out of poverty is a matter of environmental *and* economic justice. Communities that bore the brunt of the fossil fuel economy should draw the greatest economic benefit from the new green economy.

But developing an inclusive green economy is as much a pragmatic imperative as a moral one. Achieving the successful transition to a greener, greater New York will require the participation of all New Yorkers. Joblessness and unemployment will hamper many communities' ability to participate in the necessary, citywide push for greater environmental sustainability.

Programs that create green job opportunities for economically disadvantaged New Yorkers empower them and let them play an active role in the city's sustainability initiatives, which erases the negative choice between day-to-day survival and a more sustainable future. New York needs a broad-based green-collar workforce if it is to become a more prosperous, green, and just city.

A focus on employment is crucial because the communities most burdened by pollution are also disproportionately burdened by unemployment and joblessness.

New York City and target populations

Between the first quarter of 2008 and 2009, the unemployment rate among African Americans increased by 167 percent in New York City alone.¹⁴⁶ This adds to an already growing gap between unemployed and employed African Americans in the city.¹⁴⁷ Unemployment rates are unequally distributed across the five boroughs, with the Bronx and Brooklyn having the highest rates of unemployment.¹⁴⁸ Underserved and underrepresented communities are consistently left out of economic development. Going forward, we must do much more to break this pattern.

New York City's emerging green economy should foster a more economically and environmentally just New York by:

- Enhancing the scale, scope, and efficacy of our sustainability efforts.
- Diversifying New York City's economy.
- Growing sectors that are accessible to New Yorkers with barriers to employment.

To achieve these goals, green workforce development must engage, empower, and employ New Yorkers who have been excluded yet hurt by the fossil fuel-based economy and its unsustainable practices, and who have been so far minimally involved in citywide sustainability efforts. Specifically, an inclusive green economy should provide opportunities for:

- Low-wage and underemployed workers with limited opportunities for advancement in their respective fields.
- Chronically unemployed and jobless New Yorkers.
- Out-of-school and at-risk, in-school young people ages 16 to 24.
- New Yorkers transitioning out of incarceration.
- Workers with limited English.

The city will need to localize workforce development to make it greener and more inclusive. Localization means emphasizing the local production and consumption of food, energy, culture, and other goods and services. It has become a key strategy in sustainability efforts because it reduces the amount of fossil fuel used to transport goods from where they are made to where they are consumed.

Localization is also fundamental for economic justice because local production of goods can create local jobs and in turn promote local economic development by keeping money in the community. There is a growing consensus that a localized approach to workforce development, in which pre-employment, wraparound, and on-the-job training programs are coordinated collaboratively within a community to support local industries, can be extremely effective at overcoming barriers to employment.

Green workforce development must engage, empower, and employ New Yorkers who have been excluded yet hurt by the fossil fuel-based economy and its unsustainable practices.

The programs that already focus on creating an inclusive workforce should be further developed and replicated across New York City. Other programs can be tailored to meet the needs of workers with barriers to employment and should be reoriented to focus on a more holistic approach to workforce development and training workers for the new economy.

While there are several excellent programs in the city targeted at workforce development among communities of color and poor communities, the continuing high unemployment rates in these communities reflect an urgent need to scale up outreach and employment to these populations.

The new green economy offers new possibilities that differ from traditional economic policy because green work can take place in every neighborhood. Underserved populations are, in fact, at greater need for retrofits or energy conservation measures because higher electricity costs disproportionately affect their household budgets.¹⁴⁹ As a result, the unemployment trend can be reversed by hiring local residents to work within their neighborhoods bringing economic and environment benefits to underserved areas.

Best practices for workforce development

Below are a few examples of locally based training and workforce development programs that address pre-employment training, barriers to employment, and empowering local communities and their members. These programs are in addition to the training programs previously mentioned.

Environmental justice leadership programs

Environmental justice leadership programs emphasize that communities can and should speak for themselves on issues most affecting their residents. These programs help to provide leadership tools and advocacy skill development. Examples include:

- **El Puente** is a community-based human rights organization that engages community members in scientific research, advocacy, and environmental justice work. Its Community Health and Environment Institute trains people to research environmental health problems in their neighborhoods, organize for and build green spaces and waterfronts, and provide affordable health services.¹⁵⁰
- **The Point** is a youth and community development program dedicated to improving the cultural and environmental quality of Hunts Point in the Bronx. It has led projects in environmental justice advocacy which include building a community garden, deconstructing the Sheridan Expressway, conducting a study on air pollution in Hunts Point, and organizing for the creation of the Hunts Point Riverside Park.¹⁵¹

Green job readiness

A complete workforce development system should help bring workers out of poverty and incorporate sustainability

An effective green pre-employment and job readiness citywide system providing pathways out of poverty retains all of the strong components of the existing system while improving on weaker components and incorporating sustainability initiatives. The result is a complete program providing:

- **Adult basic education:** Many people who have barriers to employment lack basic education needed to hold a job such as reading comprehension, writing, mathematics (algebra, geometry, fractions, and decimals), problem analysis, and other skills. Adult basic education programs can help adults receive the education necessary to earn a GED or gain specific knowledge that is required of a job without earning a GED.
- **Sustainability awareness and training:** Sustainability training tied into workforce development helps people with barriers to employment gain a sense of empowerment from understanding that their work not only provides them a self-sustaining and family-sustaining income but also helps create a healthier environment for their children and their grandchildren.
- **Centralized information on in-demand sectors:** Green workforce development programs can achieve a higher rate of job placements by providing people with barriers to employment efficient, easy, and centralized access to in-demand sectors. Centralized information on in-demand sectors helps already distressed clients avoid undergoing fruitless job searches and bureaucratic hurdles that many of them cannot do on their own.
- **Programmatic alignment with sustainability initiatives:** Aligning training programs with in-demand sectors as identified in sustainability initiatives such as PlaNYC 2030 will help train workers for the right jobs and give them the necessary skills.
- **Place-based emphasis:** An emphasis on local, neighborhood-scale jobs instead of on city-scale jobs has both environmental and social benefits. Local jobs reduce traveling time—being able to walk to work rather than spend an hour on the subway—and costs (for example, not having to spend subway fare). Local jobs also help clean, beautify, and improve

the environmental quality of disadvantaged neighborhoods, which are often environmentally stressed.

- **Employee-employer coordination:** Green workforce development programs should identify employers that are seeking green-collar employees to streamline clients toward existing companies and agencies.
- **Strong case management, client tracking, and provider coordination systems:** Strong case management identifies a client's specific educational, training, and support needs to help them secure a job appropriate to their financial and life situation. It also helps the client manage chronic life stresses that may place them back in a state of unemployment or underemployment.

Strong case management tracks clients over time to make sure they are staying at their job and are able to retain the job in the future or advance to a higher-paying job. The coordination of trainer providers is also necessary to help clients gain new training and education for higher-paying positions or new jobs.

- **Soft skills training and wraparound services:** Soft skills programs include lessons on personal responsibility, professional etiquette, and other social values surrounding the workplace. These programs have been shown to dramatically increase worker retention rates. Wrap-around services include providing subway fare, child care, physical disability services, and other aid that helps reduce the financial and emotional stress of going to work in the first few months or years of starting a job. Providing this training and support improves the worker's chances of successful and sustained employment.
- **Mechanisms to overcome common barriers to employment and training:** Many people experience unexpected barriers to employment such as former incarceration, a lack of child care, physical or other disabilities, lack of immediate funds for daily expenses, and many others. These unforeseen challenges can prove to be effective barriers to employment and must be overcome through changing attitudes, implementing policies, and providing financial assistance and other services.

- **UPROSE** is a community-based organization in Sunset Park, Brooklyn. It works with community members, especially youth, to raise environmental awareness and environmental and economic justice. Its Summer Youth Empowerment program exposes youth to social and environmental justice issues and trains them to organize campaigns.¹⁵²
- **Youth Ministries for Peace and Justice** trains youth in the South Bronx to rebuild their neighborhoods through community development, organizing, and spiritual support. YMPJ's Center for Community Development and Planning trains young South Bronx residents to become educated on environmental justice issues and organize for greening projects. For example, the youth of the South Bronx have successfully advocated for the Bronx River Greenway, a restoration project that will improve access to the Bronx River.¹⁵³

Adult basic education providers

As detailed above, many people have barriers to employment due to a lack of basic education needed to work, such as reading skills, writing, and mathematics. The programs listed below are examples of basic education providers.

- **Brooklyn Public Library's TELL Computer Workshops:** The Brooklyn Public Library gives free English classes to non-English speakers. Its TELL program also incorporates 12-hour computer basics workshops into its English classes.¹⁵⁴
- **LaGuardia Community College's Adult Learning Center:** The center provides a comprehensive list of programs that target adults from all ability levels. Its New Readers program teaches reading skills to beginning readers and those with a learning disability. It also has a Spanish literacy program that helps native Spanish speakers become more fluent in Spanish before moving on to English.¹⁵⁵
- **SEIU 32BJ's Thomas Shortman Training, Scholarship and Safety Fund:** The Shortman Fund provides free training in English as a second language, industry skills, and computer skills to eligible members of Local 32BJ. It also provides college and graduate school scholarships to eligible members and their eligible dependents to advance their education.¹⁵⁶
- **University Settlement's Literacy Program:** University Settlement, the first settlement house in the country established in 1886, provides physical, psychological, and educational tools to 20,000 immigrants annually in the Lower East Side. Its literacy program annually teaches 300 adults to read, speak, and write English.¹⁵⁷



GLORIA WEISS—CWE



LEIGH PASQUAL, URBAN AGENDA

Consortium for Worker Education: Building analyst prep training

“Interested in a career as an energy auditor? Want to learn about green jobs in energy savings?” These are some of the taglines for the Consortium for Worker Education’s building analyst courses, run free of charge for anyone interested in a green-collar career.

CWE’s Building Analyst Prep Class, which just completed its pilot run with a group of 16 students, focuses on the basic skills necessary to become a building analyst with Building Performance Institute certification, a New York State-recognized exam.

According to Gloria Weiss (pictured above), who teaches the prep class, the training for the BPI exam is an intense process, and it can be intimidating for people who are interested in the energy efficiency and weatherization industry but unfamiliar with the related scientific and technical vocabulary.

“BPI training toward certification, offered by organizations such as the Association for Energy Affordability, is an intensive six-day course with a written and field exam at the end of it. What CWE is trying to do is help people acquire the necessary basic math and building science knowledge to be able to take this course, pass the test, and find a job,” said Weiss.

The CWE prep classes focus on reaching out to economically disadvantaged New Yorkers, such as jobless, low-wage, and underemployed workers, out-of-school youth, workers with limited English language skills, and those transitioning out of incarceration.

“Some of our students don’t have GED credentials, and some also live in shelters. There are others who might have math anxiety or low academic English skills,” says Gloria. “Our prep class helps people to break through these obstacles and learn study skills and the right academic language to open up their opportunities.”

Students in the CWE class also find a support network as students help each other master the materials, whether it is a convective heat loss calculation or understanding a particularly difficult section of a building science book. “The class forms a community, and knowing there is a good job at the end that will pay well and help the planet inspires everyone,” adds Gloria.

CWE’s Director of Development Rebecca Lurie says the CWE also focuses as much as possible on job placement for their students. “Job placement is an important step in the training process for us. We want to ensure that our students have immediate opportunities to embark on the career paths that green jobs provide,” she said.

Place-based workforce and community development organizations

A continuing theme in this report is local development: local employment, local environmental improvement, and local residents being empowered. The programs below are focused on providing employment and services within their neighborhoods.

- **Coalition for the Improvement of Bedford Stuyvesant:** The coalition represents more than 30 community development, planning, and social service providers serving Bedford-Stuyvesant that are collaborating to improve the neighborhood through policy and activism. In 2007 it worked with the Pratt Center for Community Development to adopt the Bedford-Stuyvesant South Rezoning Plan, a plan that will preserve historic areas and designate environmentally contaminated sites.¹⁵⁸
- **JobsFirstNYC's Sunset Park Alliance:** The Sunset Park Alliance engages all youth agencies and employers in the Sunset Park neighborhood through a shared set of values to connect disconnected youth to the workforce.¹⁵⁹

Programs addressing barriers to employment and training

Systemic barriers to employment continue to disproportionately exclude communities of color and poorer communities, and they remain a fundamental block to community development. Examples include discriminating against formerly incarcerated individuals or the lack of child care and family support. The following programs offer support for people with barriers and should be combined with an aggressive campaign to remove barriers.

Incarceration

The NYC Bar Association recently published a report titled, “Legal Employers Taking the Lead: Enhancing Employment Opportunities for the Formerly Incarcerated.” It details how law firms and other legal employers can affirmatively hire more formerly incarcerated people.¹⁶⁰

Lack of child care

The Children's Defense Fund's Head Start program helps children living at or below the poverty line with cognitive, social, emotional, and physical development so that their parents are able to work. It also helps parents stay involved in their children's lives while still working.¹⁶¹

Immediate income needs (poverty)

The United Way of New York City's MoneyUP program provides financial stability to working people living at or below the poverty line. It offers free financial services such as free tax preparation to determine their eligibility for the Earned Income Tax Credit; free coaching on how to increase assets, decrease debt, improve credit score, open a bank account, and achieve a financial goal; and free year-round legal services.¹⁶²

Systemic barriers
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Recommendations for ensuring green economic growth reaches target populations

Every action New York City takes to build the new green economy must include the principles discussed above: redefining sustainability, localizing employment, and reorienting existing workforce development programs to serve new and emerging industries and occupations. To this end we recommend that the city:

Encourage and promote local hiring for sustainability initiatives

The city should make existing sustainability initiatives—for example, the MillionTrees Initiative, Destination Park Completions, Department of Environmental Protection remediation, and cleanup projects—and other citywide projects greener through local training and hiring provisions and strong community-benefit agreements.

Coordinate city, state, and federal resources and programs

Maximize federal resources for local programs

The city should tap and promote federal and innovative resources for community-based green job training initiatives such as energy block grants and smart-growth funding.

Promote sustainability through city and state agency coordination

The city should work with and convene Department of Education, Department of Youth and Community Development, and community youth programs to develop educational and awareness tools on sustainability issues and green-collar training for young people.

Strengthen partnerships between city and community organizations

Develop local green entrepreneurship

The City Council should work with community leaders to develop community-based green entrepreneurial workshops focused on Building Performance Institute certification and small business development.

Develop green jobs training resources

The city should partner with community-based organizations to develop a green job training resource component of GreeNYC and other public sustainability campaigns.

Remove structural barriers preventing employment

Expand Human Resources Administration programs to include green training and workforce development

The city should classify green training sites as Human Resources Administration-approved, which would count toward the mandatory work requirements for recipients of certain HRA services and increase the Human Resources Administration's knowledge of existing green workforce development

Strike incarceration barriers for federal funding for green-collar jobs

The city should lobby for striking incarceration barriers from federal funding for green-collar jobs and work with the Department of Corrections on the best way to achieve this.

Conclusion and roundtable recommendations for growing good green jobs, meeting workforce needs, and reaching target populations in NYC

The roadmap's fundamental goal is to make certain the green economy's growth creates broadly shared prosperity for businesses, communities, and workers. The recommendations presented reinforce these ideals, and they should not be taken in a vacuum—each recommendation is inextricably linked to the next. Therefore, implementing these recommendations requires a holistic approach to achieve equitable and sustainable long-term green economic growth.

The roadmap presented detailed, specific recommendations for meeting the workforce needs of the future green economy in New York City. The recommendations can broadly be categorized as follows:

Grow the green economy to create good green-collar jobs

Amend the city's procurement process to allow local sourcing

Currently, the city's procurement rules do not give preference to sourcing from local manufacturing or local businesses. The city should amend the procurement process to give preference to local sourcing. This would encourage the growth of local businesses and reduce the environmental impact of projects due to decreased transportation requirements.

Incentivize the growth of green manufacturing businesses

The city should encourage the growth of a green manufacturing sector in the city that would provide new businesses and employment opportunities. It should eliminate any zoning restrictions that prevent green manufacturing and should provide tax incentives to manufacturing businesses, which would also be tied to local hiring provisions and other job standards.

Implement large-scale building retrofits and large-scale renewable energy projects

The city should mandate large-scale building retrofits and large-scale renewable energy projects that would decrease greenhouse gas emissions, provide large-scale energy savings, create good jobs, and bring the city closer to energy independence. It should also ensure there is an adequately trained workforce of construction workers and building maintenance personnel to implement these policies.

Reach a full state of good repair on New York City's roads, subways, and rails

Before building new infrastructure the city should invest the time and capital so the existing structure of roads, subways, and rails are in a full state of good repair.

Expand brownfield remediation

The Office of Environmental Remediation was created as part of PlaNYC to oversee brownfield redevelopment in the city. The mayor should expand the office and adequately fund it so it can meet the office's mandate.

Expand the MillionTrees NYC program

The city should drastically expand the MillionTreesNYC training program with particular attention to vacant climber and pruner positions.

Jobs created should be good jobs and reach target populations

It cannot be said enough: For the new economy to be sustainable and prosperous the jobs must be good jobs and they must be accessible and available to underserved populations. Going forward, an inclusive, strong economy will provide benefits not just to communities, but also to the city through an increased tax base, lower crime, and increased environmental benefits. To reach these goals the city should:

Incorporate job standards into PlaNYC projects

PlaNYC, the city's blueprint for achieving environmental sustainability, should explicitly incorporate wage, safety and health, local hiring and local sourcing requirements, and subcontractor provisions into all projects that advance its goals. Environmental sustainability must also include individual sustainability. Strong job standards bring individuals closer to sustainability by providing safe working environments and family sustaining wages and benefits. Local hiring and local sourcing would also decrease the carbon footprints of projects by decreasing the travel costs of the project.

Tie public incentives to job standards

Government and public projects should never create or support poverty-level jobs. Public investment in green industries and job growth and development in the form of tax breaks, grants, subsidies, or contracts to businesses must be tied to a living wage—and where applicable prevailing wage jobs with standards. Jurisdictions that require job standards are not less business friendly. Currently, 89 jurisdictions across the country attach job quality standards to at least one development subsidy.

Engage in community-led development

Community-supported development goes beyond requiring a community benefits agreement. Working closely with community groups and interests makes for a more streamlined and efficient development process that has greater community support. Community-

led development ensures that community members also benefit from the development through local job creation, protection from any environmental hazards that may arise from the development, and long-term economic gain.

Encourage and promote local hiring for sustainability initiatives

The city should make existing sustainability initiatives—such as the Million Trees Initiative, Destination Park Completions, Department of Environmental Protection remediation, and cleanup projects—and other citywide projects greener through local training and hiring provisions and strong community-benefit agreements.

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Strike incarceration barriers for federal funding for green-collar jobs

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Help current workers and employers transition to green

Going forward existing businesses will need support and assistance to make their operations more environmentally sustainable and link them with properly trained workers. The existing workforce must also have a period of retraining to transition their current skills to ones that will be needed. In particular:

Identify strategies to transition benched workers

The mayor should convene a Commission on Energy Efficiency Construction Work to identify strategies to transition benched construction workers to building retrofit work

Monitor incumbent workers' skills

The city should monitor incumbent building management workers' retrocommissioning and efficient maintenance skills and training to ensure they're prepared to realize revised energy and building codes and sustainability goals—30 percent emissions reduction target by 2030, as legislated by the city council in the Climate Protection Act of 2007.

Increase outreach and support for small green businesses

The mayor should task the city's Small Business Services with initiating a strategic outreach to small green businesses. The outreach would introduce businesses to NYC Business Solutions Resources, identify workforce needs and training capacity, and convene workforce capacity building seminars.

Provide training support for green businesses

The city should develop "Green Enterprise Zones" that would build the capacity of green businesses to train and prepare their employee base, including providing on-the-job training.

Help "nongreen" companies become more sustainable

Small Business Services should work with other agencies to identify nongreen companies in emerging green fields and help them become more sustainable.

Increased coordination and cooperation among city agencies and local, state, and federal efforts

Many of the recommendations focus on the need for more coordination between local, state, and federal agencies. A coordinated effort helps streamline processes and makes them less confusing for businesses, workers, and potential workers. In particular the city should:

Include retrofits in requests for proposals process

The city should press Small Business Services to include energy efficiency and/or retrofits on its list of applicable "sectors" in the Workforce 1 requests for proposals process.

Develop green workforce training as part of the license process

The city should work with the Department of Consumer Affairs to develop a mandatory green workforce training as part of the Home Improvement Contractors License process.

Coordinate with the New York State Energy Research and Development Authority to create a training resource center

To further integrate and build the capacity of existing building analyst, renewable, and energy efficiency training programs, the city should work with NYSERDA to create a training resource center with high-tech equipment and building analyst facilities to be used by multiple providers. The Hudson Valley Community College's TEC-SMART program is an example of such a program already up and running.

Develop cross-sectoral green certifications

The Office of Long Term Planning and Sustainability should work with other agencies to develop a cross-sectoral green business certification or rating system that could serve as criteria for evaluating private enterprises applying for green workforce development funding or supports in the mold of M/WBE certification. This certification would have a

branding component similar to that of B-corporations and would be a level of recognition or standard that many green companies would seek.

The Office of Long Term Planning and Sustainability should also convene industry stakeholders representing the different green certifications—U.S. Green Building Council, Building Performance Institute, Leadership in Energy Efficiency Design, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, etc—to create streamlined certifications for each sector that better identify a company’s ability to reach the city’s green targets.

Create an intergovernmental task force on green jobs standards

The city should convene an independent green job standards task force to determine how to secure job standards for workers and ensure a common understanding of scope and definition of standards among levels of government. The task force should include representatives from federal, state, and local agencies, such as the U.S. Department of Energy, the New York State Department of Housing and Community Renewal, the New York State Public Service Commission, the Mayor’s Office of Long Term Planning and Sustainability, and advocates from community, environmental, and labor organizations.

Such a committee would allow policy and program coordination—to avoid contradictory work—as well as oversight and enforcement of job standards for green jobs.

Maximize federal resources for local programs

The city should tap and promote federal and innovative resources for community-based green job training initiatives such as energy block grants and smart-growth funding.

Promote sustainability by coordinating state and city agencies

The city should work with and convene Department of Education, Department of Youth and Community Development, and community youth programs to develop educational and awareness tools on sustainability and green-collar training for young people.

Engage in cross-agency cooperation to develop an adult education curriculum

The Mayor’s Office of Adult Education and the Mayor’s Office of Sustainability and Long Term Planning should develop an adult education teaching curriculum on sustainability modeled after the successful implementation of the curriculum recently completed by the Department of Health.

Expand and green existing programs

As detailed in the roadmap there are many existing programs that can be expanded to serve more people and populations and that can also be adapted for the new economy by integrating “green” elements into their programs. Specifically:

Expand Building Performance Institute training resources

The city should expand the capacity of current colleges offering BPI training, identify new colleges to offer BPI training, and finance a public awareness campaign to promote BPI certification.

Expand career and technical education school curricula

The city should work with the Department of Education to incorporate retrofit and building efficiency work into the curricula of construction-based CTE schools.

Appoint a workforce development point person in the Mayor's Sustainability Office

The Office of Long Term Planning and Sustainability should create a workforce development point person to monitor the workforce needs of PlaNYC Initiatives as they are developed and implemented.

Require green training where appropriate for city workers

The city should play a leading role and set an example by requiring green training where relevant to specific job titles as a part of human resources policies for promotion and advancement.

Fund and green the Jobs to Build On Program

City Council should earmark funding to green the Jobs To Build On program, a program funded by the city council to assist those that are unemployed, underemployed, or just entering the workforce.

Expand Human Resources Administration programs so they include green training and workforce development and catalogue certifications

The city should classify green training sites as Human Resources Administration-approved would count toward recipients of certain HRA services' mandatory work requirements and increase the Human Resources Administration's knowledge of existing green workforce development. The Human Resource Administration should also develop a centralized online resource for green training in the city and compile information on what types of certifications are available.

Establish an oversight committee on workplace safety and health

The city council should establish an oversight committee to provide guidance on workplace safety and health and job hazard analysis. The committee should use applicable OSHA standards and other applicable regulatory requirements and best professional practices and guidance where legal standards do not exist or are outdated. It should also include representatives from government, business, labor, and community-based organizations as well as scientific and other experts.

Collect data to make sure the green economy's growth is prosperous for business, communities, and workers

The city should engage stakeholders and use their collective knowledge to inform policies and directives. It should also collect data on areas and industries that are not as well known or that have great potential for growth to ensure the green economy is equitable, sustainable, and just. In particular the city should:

Survey green businesses

The city should work with the Workforce Investment Board and the City University of New York Center for Urban Research to survey green businesses and engage them as part of the Labor Market Information System. The survey should determine whether the jobs created are good jobs. Sample questions should include:

- Did these jobs create pathways out of poverty?
- Who is getting the jobs?
- What level of job retention do the jobs have?
- Do people advance in the jobs?
- Is there a clear career path for workers in these jobs?
- Are businesses happy with their workforce?

Analyze the occupational health and safety of emerging industries

The city should commission a study on occupational health and safety training in emerging and unregulated green subsectors including renewable energy installation home performance contracting and weatherization, and hybrid vehicle maintenance.

Evaluate PlaNYC in terms of job creation

In addition to sustainability goals PlaNYC 2030 should be evaluated in terms of how many jobs are created through the implementation of the initiatives. These numbers are an important mechanism for evaluating the initiatives' success and can be used as an accountability measure.

Create a task force for third-party financiers

The City Council should create a task force to work with third-party financiers who fund energy efficiency or other green projects that aim to fulfill public mandates. The task force would make sure that private capital attached to the city's sustainability initiatives creates jobs with good wages, benefits, and opportunities for advancement.

New York City has the public will and political power to become a global leader in city-wide sustainability and green economic growth. The way out of the current economic and climate crisis must be more economically, environmentally, and socially sustainable than our current path. Together we can move the city toward a greener future that is good for all its residents, businesses, and communities.

Appendix 1

Major market forces for green job sectors

Energy

Municipal initiatives

30x30 greenhouse gas emission reduction

The Bloomberg administration and the City Council, in conjunction with a broad range of stakeholders, have undertaken several initiatives with the goal of reducing citywide greenhouse gas emissions 30 percent by 2030 while meeting the city's projected energy demand, as outlined in PlaNYC 2030.

Greenhouse gas emission reduction from buildings

Several of the most important city emissions reduction initiatives target the building stock. For example, Mayor Bloomberg's Energy Planning Board has developed plans for reducing greenhouse gas emissions 30 percent by 2017 from municipal operations, including municipal buildings. A suite of municipal building efficiency projects will be financed with an annual commitment of 10 percent of the city's energy budget—approximately \$80 million in fiscal year 2008. As of April 22, 2008, the Energy Planning Board has launched 14 initiatives.¹ Over 10 years the initiatives are expected to create about 124,000 jobs in construction, maintenance, and engineering.²

Greener, Greater Buildings Plan

The City Council passed the Greener, Greater Buildings Plan in 2009—four pieces of legislation that will require buildings over 50,000 square feet to benchmark their energy and water use, undergo periodic energy audits, and implement retrofit measures with a five-year payback.³ This legislation is predicted to create over 2,000 new jobs in energy auditing and thousands of temporary construction jobs over 10 years.⁴

Solar panels on rooftops

The New York City government has also led in renewable energy, notably releasing a request for proposal for the installation of 2 megawatts of solar panels on municipal rooftops that will double the amount of solar capacity installed in the city.⁵ The administration and City Council also successfully pushed for state passage of a property tax abatement for solar panel installations, available through 2012, under which all classes of property owners are eligible for up to \$62,500 annually, or the amount of real property taxes owed

during a year.⁶ Investment in solar energy would create 42 percent more job-years per dollar than a comparable investment in fossil fuel.⁷

State and regional initiatives

New York State Energy Research and Development Authority programs

NYSERDA's efficiency and clean-energy incentive programs have, since 1975, collectively reduced participant energy costs by more than \$340 million annually; served over 60,000 low-income households, with average household energy bill reductions of \$220 per year; and created and retained 3,700 jobs.⁸

In New York City NYSERDA has played an especially important role growing the market for building energy efficiency services in the private sector. Specific NYSERDA programs of note in this area include:

Home Performance with Energy Star

The Home Performance with Energy Star program for existing residential buildings with one to four units provides loans and incentives for building owners to undertake retrofits using certified contractors and provides support services to help participating contractors expand their market presence.⁹ Home Performance with Energy Star is part of NYSERDA's New York Energy Smart Program, which has created about 5,500 jobs from 1999 to 2006 and is estimated to create 4,201 jobs from 2007 to 2016 in the building retrofit and energy efficiency industries.¹⁰

Multifamily Performance Program

The Multifamily Performance Program for existing residential buildings with more than four units provides incentives for building owners to undertake retrofits using a program partner network of engineers, energy consultants, and other industry professionals.

Flexible Technical Assistance Program

The Flexible Technical Assistance Program identifies and implements cost-effective energy efficiency measures for industrial and commercial businesses, state and local governments, nonprofit and private institutions, public and private K-12 schools, colleges and universities, and health care facilities using competitively selected engineering firms. To date FlexTech has overseen over 24 successful projects throughout the state, including four in New York City.¹¹

Energy efficiency portfolio standard

The energy efficiency portfolio standard is a statewide energy efficiency initiative that aims to reduce New York State's electricity use 15 percent by 2015. To meet this goal the Public Service Commission set specific reduction targets for electric and gas utilities, and

it increased the system benefits charge—a *charge* on a consumer’s bill from an electric distribution company to pay for the costs of certain public *benefits*—which raised annual revenue from \$175 million to over \$334 million. Half of these new funds go to NYSERDA programs and half to new utility-administered conservation programs mandated by the Public Service Commission.

It is projected that the EEPs will create more than 50,000 jobs over the next three years statewide, particularly in building energy efficiency services. Over \$16 million in EEPs funding has been designated for workforce development.¹²

Regional Greenhouse Gas Initiative

The 10 states participating in the RGGI—Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont—are implementing the first mandatory cap-and-trade program in the United States to reduce greenhouse gas emissions 10 percent by 2018.

As of April 2009, New York State has participated in three carbon credit auctions as part of this regional plan. New York has earmarked its \$87 million in auction revenues to fund programs that reduce greenhouse gas emissions and expand the state’s energy efficiency and renewable energy markets. NYSERDA is facilitating an RGGI Operating Plan Advisory Group to develop a comprehensive strategy for investing proceeds into residential, commercial, and industrial renewable technology, efficiency programs and retrofits, clean transportation, energy-based workforce development, and related areas.¹³

Renewable portfolio standard

A renewable portfolio standard is a policy that seeks to increase the amount of renewable electricity used by retail customers. New York State’s goal is to reach 25 percent by 2013.¹⁴ Increasing the amount of renewable electricity required will increase the demand for jobs in areas such as solar energy and wind energy.

Federal initiatives

Weatherization Assistance Program

WAP helps low-income families permanently reduce their energy bills by improving the energy efficiency of their homes. Since 1976 the program has helped 6.2 million low-income families reduce their energy bills 32 percent on average, or about \$350 per year at current prices, while helping to create over 8,000 technical jobs in income communities.¹⁵ In New York City over \$91 million has been tentatively allocated to 15 weatherization providers under ARRA.¹⁶

American Recovery and Reinvestment Act programs

In addition to the increased funds for weatherization the ARRA also funded:¹⁷

- \$3.3 billion in smart grid development grants and \$615 million for smart grid storage, monitoring, and technology viability. A smart grid delivers electricity from suppliers to consumers with digital technology to reduce cost and increase reliability and transparency.¹⁸
- \$3.2 billion to the Energy Efficiency Community Block Grants program. This program had a broad mandate and provides funds to local and state government to improve energy efficiency and reduce energy use and fossil fuel emissions in their communities.
- \$300 million for the Energy Efficiency Appliance Rebate program.

Private sector initiatives

Policies such as net metering—which allows private owners of renewable energy systems to sell excess energy they produce—tax abatements, and other programs are helping to grow the market for renewable systems and support green job-creating businesses like solar panel installation companies in the private sector. At the same time, large renewable energy system installations are pioneering new models for electricity generation in New York City with the potential for local, clean-energy jobs. Companies engaging in innovative, renewable energy efforts include:

Alteris Renewables, Inc.

Alteris is the largest integrator of renewable energy systems in the Northeast with over 2,000 solar photovoltaic and solar thermal energy installations. It recently acquired the New York-based solar installation company, Renewable Power Systems.¹⁹ This expansion will allow Alteris Renewables and Renewable Power Systems to cooperatively bring better designs, more affordable solutions, improved customer service, and a wider array of financial options.²⁰

Bluewater Wind

The leading developer of offshore wind energy in the Northeast recently partnered with the Long Island Power Authority to build a wind park located more than six nautical miles offshore that will provide energy for 42,000 Long Island homes.²¹ Although no policy or technical assessment has been done, this project indicates a huge potential for homes and businesses in New York City to draw energy from offshore wind parks in Long Island in the future.²²

Verdant Power

Verdant Power's Roosevelt Island Tidal Energy project in New York City's East River was launched in 2002 as a pilot for harnessing the river's tidal energy to generate electricity. Currently, it is the world's first grid-connected array of tidal turbines able to produce 80 megawatts of electricity for commercial uses.²³ It completed its demonstration phase in 2008 and is now being built out to produce commercial power on a megawatt scale.²⁴

Utility initiatives

As part of New York Governor David Paterson's 15 x 15 Initiative, Con Edison, a New York City electricity provider, and National Grid, an electricity distributor, will be administering their own energy conservation programs. For example, Con Edison has proposed an energy efficiency portfolio to the Public Service Commission that includes a Small Business Direct Installation Program, helping businesses survey and install low-cost efficiency measures. The program will potentially lead to 5,000 retrofits in New York City.²⁵

National Grid's new programs in New York City include the Low-Income Energy Conservation Program to help low-income families reduce their heating costs by increasing energy efficiency.²⁶ In Massachusetts, a recent residential and business energy efficiency plan developed by a group of utilities, including National Grid, is expected to create 4,000 jobs over three years.²⁷ National Grid's energy efficiency programs in New York State may have similar job impacts.

Urban forestry

Street Trees programs

The 10-year MillionTreesNYC initiative is led jointly by the New York Restoration Project and the Parks Department. Its goal is to plant a million trees across the five boroughs of New York City by 2017. To date, about 240,000 trees have been planted.²⁸ Recent zoning amendments are projected to result in the additional planting of 10,000 new street trees per year.

Parks programs

The city is in the planning phase for expanding and completing eight large destination parks in all five boroughs. Construction and design for many of these parks is set to begin over the next few years.

The GreenStreets program, a partnership between the Parks Department and the Department of Transportation, converts paved traffic islands and medians into vegetated spaces. The Parks Department has completed the design and construction of dozens of new Greenstreets in the last couple of years. There are plans to scale up this open space program in the immediate future with the ultimate goal of creating up to 800 new Greenstreets by 2017. Mayor Bloomberg has funded an additional 156 staff to carry out this initiative.²⁹

Green roofs programs

Under a new law passed by the City Council, building owners can apply for a one-year property tax credit up to \$100,000 for the construction of green roofs. The program will expire on March 15, 2013, unless it is extended. The credit covers approximately 25 percent of the typical materials, labor, installation, and design costs associated with installing a green roof.³⁰

Green product development and manufacturing

Leadership in Energy and Environmental Design standards

The United States Green Building Council's Leadership in Energy and Environmental Design standards are the best-known certification for green buildings. The council awards new and existing buildings a certified, silver, gold, or platinum rating based on the sustainability measures incorporated. Many of the leading building construction companies have already embraced LEED for large, new commercial and residential buildings, both as a way to reduce long-term operating costs and as a tool for marketing their properties.

Local Law 86

In New York City, under Local Law 86, most new municipal buildings and major renovations are required to meet the functional equivalent of LEED standards.³¹ LEED awards points toward certification for the use of materials procured within a 500-mile radius of the building site. If widely adopted, this could dramatically grow demand for locally manufactured green materials. Currently, however, Local Law 86 excludes local sourcing from the points needed to achieve compliance.

Industrial business zones

IBZs are designated areas where the city provides expanded assistance services to industrial firms in partnership with local development groups. IBZ designation guarantees that the industrial land will not be zoned for residential uses, retaining space for local manufacturing. The city will invest roughly \$17 million through 2009 to create IBZs, assisting the manufacturing sector in capturing relocation tax credits, enhancing sanitation services, and creating employee training programs. The goal of IBZs is to preserve and grow the number of existing industrial companies. For example, the North Brooklyn IBZ is home to over 600 existing manufacturing and industrial firms.³²

New York City Solid Waste Management Plan

The 2006 plan set ambitious recycling and waste diversion goals that have revitalized the local recycling industry. The city recently expanded a recycling facility in Staten Island, expanded yard waste collection, developed new recycling programs for electronics, and increased the number of on-street recycling bins to reach the goal of diverting 70 percent of the waste stream to recycling and reuse by 2015. As part of the plan the city also signed a 20-year contract with Hugo Neu,³³ a recycling company, which will build a recycling station on the Brooklyn side of the East River creating 160 construction jobs and 100 permanent jobs.³⁴

New York City Materials Development Program

Since 2005 this municipal program has worked to strengthen New York City's materials exchange and reuse sector by connecting, supporting, and promoting city-based reuse organizations. The Materials Development Program acts as a networking conduit that builds relationships between materials exchange organizations, provides capacity building training opportunities, and creates resources that increase public awareness of and access to waste prevention services.

Office of Recycling Outreach and Education

This municipal office, created in 2006, has facilitated tenant training sessions and seminars for building superintendents, initiated "special waste collections" for unconventional recycling materials such as textiles, and conducted building "waste audits" that identify opportunities for expanded waste diversion.

Transportation

Mass Transit Authority Capital Plans

MTA's 2008-2013 capital budget outlines billions of dollars of investment in projects that would improve local commuter rail service, provide new commuter rail access to Manhattan, and expand transit access to underserved areas. This budget will create and retain x jobs. However, with recent budget shortfalls, the extent of the implementation of the capital plan remains uncertain.

MTA renewable energy and sustainability initiatives

MTA's Blue Ribbon Commission identified several priority sustainability initiatives to implement in the coming years, including increasing system-wide recycling; maximizing the use of regenerative braking systems in new subway cars that create electricity for the car to run on; investigating the installation of wind turbines on bus depots; using wind turbines to power select subway stations; purchasing six megawatts of solar energy; expanding net metering; piloting platform screen doors to improve climate control; and doubling the number of energy audits and energy efficiency projects by 2015.

Environmental monitoring and remediation

Brownfield remediation programs

Brownfield Opportunity Area Program

The Brownfield Opportunity Area program, administered by the New York State Department of State and the New York State Department of Environmental Conservation, awards grants to municipalities and community-based organizations to remediate and develop brownfield sites. In New York City, \$1.8 million has recently have been awarded

to 10 proposed projects across all five boroughs to perform prenomination or nomination studies. No assessment of job creation has been conducted at these stages.³⁵

Office of Environmental Remediation

The New York City Office of Environmental Remediation was established in April of 2009 to expedite the remediation and development of brownfields that might not be funded under the Brownfield Opportunity Area Program. The office will initiate a Local Brownfield Cleanup Program—the first in the nation—to provide municipal oversight of brownfield cleanups. The program aims to work with communities and comply with state and federal brownfield remediation standards to remediate the city’s 7,600 acres of brownfields.³⁶

The OER plans to spend \$61.5 million through 2030 in capital construction projects, potentially creating a total of 450 temporary jobs. It plans to spend \$2 million through 2030 in operations, potentially supporting a total of 50 permanent jobs.³⁷

Brownfield Cleanup Program

The Brownfield Cleanup Program, coordinated by the New York State Department of Environmental Conservation, helps the private sector engage in brownfield remediation with the goal of reducing the development of virgin land—or “greenfields.” Recent program reforms aim to increase funding for brownfield redevelopment and to increase incentives for projects that follow planning guidelines laid out by low-income communities participating in the Brownfield Opportunity Area program, many of which are based in New York City. These reforms should have a catalyzing effect on the city’s brownfield remediation sector.³⁸

Appendix 2

Training providers

[Air Conditioning Contractors of America](#)

[ANDO International](#)

[Association for Energy Affordability](#)

[Barnard College](#)

[Build It Green! NYC](#)

[Columbia University](#)

[CUNY Baruch College- Continuing and Professional Studies](#)

[CUNY Building Performance Laboratory](#)

[CUNY Center for Sustainable Energy](#)

[CUNY City College](#)

[CUNY York College](#)

[Edward J. Malloy Initiative for Construction Skills Pre-apprenticeship Training \(Construction Skills 2000\)](#)

[Green Office Systems](#)

[Local 78 \(Laborers International Union of North America\)](#)

[Local 94 \(International Union of Operating Engineers\)](#)

[Manhattan College](#)

[MillionTreesNYC Training Program](#)

[New York City College of Technology- Department of Environmental Control and Facilities Management](#)

[New York State Department of Labor Apprenticeship Programs](#)

[Nontraditional Employment for Women](#)

[Polytechnic Institute](#)

[SEIU 32BJ](#)

[Solar One](#)

[The Steven L. Newman Real Estate Institute's Certificate Program](#)

[St. Nicholas Neighborhood Preservation Corp](#)

[Support and Training Results in Valuable Employees \(STRIVE\)](#)

[Sustainable South Bronx](#)

[United Association \(of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada\)](#)

Appendix 3

Roundtable participants who helped develop this vision statement

1. 2Revolutions
2. Aeon Solar
3. AFL-CIO Housing Investment Trust - NYC Office
4. Ameresco
5. Apollo Alliance, New York City
6. Apollo Alliance, New York State
7. Arbor E & T
8. Artisan Baking Center, CWE/ CLC Training Center
9. Association for Energy Affordability, Inc.
10. Astoria Graphics
11. Aunt and Uncle Youth Employment Services
12. Black and Male in America
13. Bronx Community College - Center for Sustainable Energy
14. Bronx Community College - Project HIRE
15. Brooklyn Workforce Innovations
16. Building Trades Employers Association
17. Building Works Pre-Apprenticeship Training Program
18. CAMBA
19. Carpenters Labor-Management Cooperation Trust Fund
20. Catholic Charities Neighborhood Services Brooklyn Queens
21. Cauldwell Wingate Company, LLC
22. Center for an Urban Future
23. Center for Employment Opportunities
24. Center for Law and Social Justice
25. Center for Urban Community Services (CUCS)
26. Center for Working Families
27. Coalition for One Voice
28. Columbia University - Center for Energy, Marine Transportation & Public Policy
29. Community Environmental Center
30. Community Impact
31. Community Service Society
32. Community Voices Heard
33. Con Edison
34. Conservation Services Group
35. Consortium for Worker Education
36. Cornell University - Global Labor Institute
37. Cornell University - School of Industrial and Labor Relations
38. CUNY - Baruch College - Steven L Newman Real Estate Institute
39. CUNY Graduate Center
40. CUNY Institute for Urban Systems - Building Performance Lab
41. CUNY - Kingsborough Center for Economic and Workforce Development
42. CUNY - The Murphy Institute for Worker Education and Labor Studies
43. CUNY School of Professional Studies
44. DC 9 Joint Apprentice and Training Fund
45. DC 37, AFSCME
46. DC 37, Local 375
47. DC 1707, AFSCME
48. Department of Youth and Community Development
49. Deutsche Bank Americas Foundation, Community Dev. Finance Group
50. The Doe Fund
51. Dress for Success Worldwide
52. Durst Organization
53. Easter Seals NY
54. El Puente
55. Envirolution
56. EPA Region 2
57. Federation of Protestant Welfare Agencies
58. FECS
59. Fifth Avenue Committee, Inc.
60. Fiscal Policy Institute
61. The Fortune Society
62. Fountain House
63. Full Spectrum NY
64. The General Theological Seminary/ Desmond Tutu Center
65. GENERGY Electric Services Co. (GESCO)
66. Goodwill Industries of Greater NY & NJ
67. Grant Associates
68. Greater NY Laborers-Employers Cooperation & Education Trust
69. Green City Force
70. Green Harvest Technology Ventures
71. Green Spaces Consulting Group
72. Greenpoint Manufacturing and Design Center
73. GreenWorks Community Development Corporation
74. Habana Works
75. Heat & Frost Insulators Local 12
76. The HOPE Program
77. Hugo Neu
78. IceStone, LLC
79. Inner-City Muslim Action Network
80. Industrial and Technology Assistance Corporation
81. International Brotherhood of Electrical Workers, Local 3
82. International Brotherhood of Teamsters, Local 237
83. International Center for the Disabled
84. International Union of Operating Engineers, Local 30
85. International Union of Operating Engineers, Local 94
86. International Union of Painters and Allied Trades, DC 9

87. Jobs with Justice – NYC
88. JobsFirst NYC
89. Johnson Controls
90. Jonathan Rose Companies LLC
91. Laborers Int’l Union of North America, Local 10
92. LaGuardia Community College
93. Law Offices of Harry Goldman
94. Lawyers for Green Jobs
95. Local 46 Labor Management Cooperative Trust
96. Lucita, Inc.
97. Manpower
98. Mason Tenders District Council
99. Medgar Evers College
100. Million Trees NYC Training Program
101. Morningside Heights West Harlem Sanitation Coalition
102. Mothers on the Move
103. Metropolitan Transportation Authority
104. National Employment Law Project
105. Natural Resources Defense Council
106. New Partners for Community Revitalization
107. Nontraditional Employment for Women
108. Northern Manhattan Improvement Corporation
109. North Star Fund
110. Nos Quedamos
111. NY Committee for Occupational Safety and Health
112. NY Industrial Retention Network
113. NY League of Conservation Voters
114. NY Restoration Project
115. NY Solar Energy Industries Association
116. NYC and Vicinity Carpenters Labor-Management Corporation
117. NYC Central Labor Council
118. NYC Department of Parks & Recreation
119. NYC Department of Small Business Services
120. NYC District Council of Carpenters
121. NYC Economic Development Corporation
122. NYC Employment and Training Coalition
123. NYC Environmental Justice Alliance
124. NYC Housing Authority, Capital Projects and Development
125. NYC Human Resource Administration
126. NYC WIB: Workforce Investment Board
127. New York State Department of Environmental Conservation
128. New York State Department of Labor
129. New York WasteMatch
130. Office of Long Term Planning and Sustainability
131. Opportunities for a Better Tomorrow
132. Osborne Associates
133. Partnership for New York City
134. Plumbers - UA Local 1
135. The Point Community Development Corporation
136. Polytechnic University
137. Pratt Center for Community Development
138. Pratt Institute - School of Architecture - Grad Ctr. Planning/Environment
139. Professional Staff Congress
140. Regional Plan Association
141. Religions for Peace
142. Rockefeller Brothers Fund
143. Roofers Local 8
144. The Sallan Foundation
145. SEEDCO
146. SEIU Local 32BJ
147. Sheetmetal Workers
148. SJF Ventures
149. Solar One
150. Southwest Brooklyn Industrial Development Corporation
151. St. Nicholas NPC/ Williamsburg Works
152. Stanley M. Issacs Neighborhood Center
153. Steamfitters Local 638
154. Steven Winter Associates – NYC
155. STRIVE
156. SUNY, Brooklyn Educational Opportunity Center
157. Sustainable Business Network NYC
158. Sustainable South Bronx
159. Tensor Energy, Inc.
160. Thomas Shortman Training, Scholarship & Safety Fund
161. Transport Workers Union (TWU), Local 100
162. United Federation of Teachers
163. UPROSE
164. Upwardly Global
165. Urban Agenda
166. The Urban Assembly
167. The Urban Assembly School for Law and Justice
168. Urban Green Council/USGBC New York
169. Urban Justice Center - Community Development Project
170. Utility Workers Local 1-2
171. The Vocational Foundation
172. Waste to Wealth
173. West Harlem Environmental ACTION (WE ACT)
174. Women in Need
175. Workforce Weekly
176. World Resources Institute
177. Youth Ministries for Peace & Justice

Endnotes

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