



Master of Public Administration in Environmental Science and Policy
School of International and Public Affairs
Columbia University

Green Collar Jobs

Designing A Green Building Retrofit Training Program
For SUSTAINABLE SOUTH BRONX

Acknowledgements

Our consulting group would like to thank our faculty advisor, Gail Suchman, for her guidance and encouragement. We would also like to thank the past, present and future staff of Sustainable South Bronx, including Majora Carter, Miquela Craytor, Rob Crauderueff and Annette Williams, for allowing us to contribute to this groundbreaking initiative. Their compassion and hard work have inspired us all. We look forward to seeing the growth of Sustainable South Bronx now and in the future. Finally, we extend our appreciation to individuals throughout the New York community who work to create green collar jobs and who have helped shape this project.

Our Group

Noura Bakkour
Katherine Bush (Manager)
Connie Chao
Susanne DesRoches
Sarah Francis
Jessica Haller
Andrew Leach
Molly Lunn (Deputy Manager)
Samantha Miller
Erin Morey
Amanda Morrison
Muhammad Rahimoon

Contact

ssb_workshop_08@googlegroups.com

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Executive Summary



As public awareness of global climate change continues to grow, the pressure on governments and private industry to act increases. With a new administration entering the White House in January 2009, analysts expect to see substantive strides toward the development of rigorous national policy. While much of the existing and proposed legislation takes a top-down approach to regulating industries that produce greenhouse gases, many lawmakers see the potential for integrating solutions to poverty and job creation with policies that address global climate change. The creation of a new green market sector promises to reframe the false notion that the aims of environmental conservation and economic development are mutually exclusive.

The term “green collar job” has roots that are unknown. However, Van Jones, a civil rights lawyer, co-founder of the Ella Baker Center for Human Rights in Oakland, California and pioneer of the “green jobs movement,” describes the term as “a vocational job in an ecologically responsible trade, for instance: installing solar panels, weatherizing buildings, constructing and maintaining wind farms, materials re-use and recycling, doing organic agriculture, etc.”^{vi} In the next several decades, this sector is projected to grow by leaps and bounds. As seen in Figure I, it is estimated that by 2030, the renewable energy (“RE”) and energy efficiency (“EE”) industries could create as many as 23 million new jobs.

Sustainable South Bronx (SSBx) is a prominent partner in this initiative.

Retrofitting buildings is one of the expanding green industries that will require a larger workforce, and one that is particularly promising at the local New York City level. The commercial and residential buildings of the City, because of their age, are extremely energy inefficient. It is estimated that 79 percent of the City’s total greenhouse gas emissions are attributable to buildings.^v

In the past few years, the substantial environmental and economic costs associated with this unchecked energy and water use have driven state and municipal government action. Financial incentives and new regulations, ranging from tax breaks for solar water heaters to the development of new building codes, are promising attempts to increase the number of building retrofits within the City. The retrofitting process includes auditing, technology installation (e.g. Energy Star appliances, low flow plumbing, Smart Meters) and maintenance. A city-wide implementation of a building retrofit program will dramatically improve the environmental and economic welfare of New York City, by increasing efficiency in buildings and decreasing costs to consumers.

SSBx wants to take advantage of these emerging trends by developing a relevant green collar job training

	Revenues (Billions of 2006 Dollars)			Total Jobs Created Direct Plus Indirect (Thousands)		
	Base Case	Moderate Scenario	Advanced Scenario	Base Case	Moderate Scenario	Advanced Scenario
RE	\$95	\$227	\$597	1,305	3,138	7,918
EE	\$1,818	\$2,152	\$3,933	14,953	17,825	32,185
Total	\$1,913	\$2,379	\$4,530	16,258	20,963	40,103

Figure I: U.S. Renewable Energy and Energy Efficiency Industries in 2030
(Source: American Solar Energy Society)ⁱⁱ

A new “green” economy will require labor that cannot be outsourced to another countryⁱⁱⁱ; hence, in 2007, the Ella Baker center launched a national initiative called “Green For All...to secure \$1 billion in funding for green collar job training in order to lift 250,000 people out of poverty across the country.”^{iv}

program. SSBx defines its mission as “environmental justice through innovative, economically sustainable projects that are informed by community needs.”^{vi} Training low-income residents of the South Bronx, thus allowing them to enter into the building retrofit industry, achieves these goals of community economic

and environmental growth.

Benefits of such a program are achieved at an individual and community level. Trainees receive education and employment, which nurture confidence, social skills and a sense of ownership in their community. In turn, the work that the trainees perform in local buildings will improve the overall health and sustainability of the South Bronx. In addition, as trainees enter the job market, the economy of the area will be stimulated as poverty decreases and median family income increases. In fact, because of these benefits, SSBx already operates a program dedicated to training local residents for green collar jobs through the Bronx Environmental Stewardship Training (B.E.S.T.) Program. Thus, expanding this organization's work to include building retrofit training is a logical and feasible next step.

There are, however, potential obstacles associated with this addition. The construction market has traditionally been subject to boom and bust cycles. Taking this into account, along with the relative youth of the retrofit industry and recent economic conditions, it is difficult to determine how the retrofit market will fare in the coming years. Also, the SSBx program may face competition from other training and labor organizations. Finally, relevant regulation, certification, and funding opportunities are tenuous. Because of this lack of a comprehensive approach, it is clear that opportunities are available, but that they may be difficult to cultivate. Fortunately, identification of these issues from the outset will ensure that any program that SSBx develops will address these concerns.

Green Collar Jobs: Designing a Building Retrofit Training Program

The purpose of this report, "Green Collar Jobs: Designing a Building Retrofit Training Program," is to highlight existing opportunities and obstacles for retrofit job training and subsequently present a program designed to overcome these barriers, while maximizing the potential for job creation and retention. To inform this work, an analysis of the market was conducted to determine building retrofit supply and demand. Retrofit skills and technologies were then reviewed, as well as relevant certifications and existing training options. Finally, stakeholders at various levels were interviewed

to identify best practices, as well as the potential for cooperation or conflict.

The proposed Green Retrofit Education and Training (G.R.E.A.T.) Program is a well-balanced and flexible training and job placement strategy. The curriculum is designed to take into consideration the best practices of similar programs, as well as current retrofit processes and technologies. The recommended training program will include classroom sessions in life, technical and supporting skills, as well as a hands-on practicum:

- Life skills are included to ensure that trainees understand what is expected of them and how best to succeed in the working world. Life skills training has been deemed an essential part of similar training programs, and courses will include workplace behavior, goal-setting and financial management.
- Technical retrofit training makes up the core of the curriculum. Trainees will learn energy auditing and the mechanics of technologies and processes used to enhance the efficiency of energy and water use in buildings. For the purposes of G.R.E.A.T., technologies have been broken into three tiers, which correspond to the complexity and expense of each technology (Refer to Figure II). In practice, SSBx may choose to include or exclude certain types of technologies as the organization sees fit. They may also wish to incorporate training that leads to industry certifications, including, but not limited to, those offered by the Building Performance Institute, the North American Board of Certified Energy Practitioners, and New York City.
- Supporting skills give the trainee knowledge to support their career growth. Courses will include an overview of the construction and building retrofit industries, and an introduction to what it means and why it is important to be an employee in an ecologically sustainable field.
- The training will conclude with a hands-on practicum, which will give trainees a chance to apply these learned skills to local building retrofits. This practicum will not only reinforce technical training, but will also give trainees the chance to green their own community.

Upon completion of the curriculum, trainees will be offered job placement services by the G.R.E.A.T. Program. The proposed job placement strategy was

Figure II: Building Retrofit Technology

Tier 1	Tier 2	Tier 3
• Installation and use of Energy Star appliances and electronics • Installation of compact fluorescent light bulbs • Changing thermostat settings and light fixtures • Installation and use of flow reduction aerators and low-flow showerheads.	• Sealing building exterior • Window replacement and insulation • Demand or tankless water heater installation • HVAC efficiency and commissioning • Programmable thermostat installation • Lighting occupancy sensors installation • Smart meter installation • High-efficiency plumbing fixture installation • Storm water mitigation • Reduced landscaping water use	• Solar photovoltaics • Solar water heaters • Green roofs

reached by considering several options, and by evaluating their potential for job creation, ability to respond to the market, and overall feasibility. The recommended strategy is a hybrid of four options (Refer to Figure III), extended throughout gradual phases:

- In the short term, SSBx will provide job placement for trainees in private and public organizations, using both internal and external resources. The B.E.S.T. Program already has substantial experience with this. However, SSBx may also choose to work with other organizations in local job placement, such as the Worker Career Center (WCC) and the New York Industrial Retention Network (NYIRN). In addition, this report identifies several businesses which have expressed a willingness to discuss future job placements for successful graduates of G.R.E.A.T.
- In the mid-term, SSBx will enhance this direct placement network by establishing a working relationship with unions as a pre-apprenticeship program. Select trainees will receive their initial industry experience with G.R.E.A.T. and will then be placed in apprenticeships, which are the first steps to joining a trade union. After one to three years, SSBx can look to increase their placement pool with a third phase by expanding their current small business,

Smartroofs LLC (Smartroofs). Currently, Smartroofs focuses on green roof installation. However, the addition of other retrofit services can potentially allow the company to train additional individuals, thus reaching a wider customer base.

- Finally, after five to ten years, SSBx may consider developing the business into an energy service company (ESCO). As an ESCO, SSBx could develop, install, maintain, and finance large-scale efficiency projects against the dollar value of the future energy savings.

For SSBx to build a successful training and job placement program in this area, it will be critical for them to tap relevant funding sources and potential partners. Funding sources vary across job placement strategies, but generally include federal, state and private options. Among these options are the Green Jobs Act, Energy Efficiency and Conservation Block Grants, New York State Energy Research and Development Authority (NYSERDA) programs, as well as grants and loans financed by private foundations and companies. Many private organizations distribute funds specifically in the name of job training and community development, including the Public Welfare Foundation, Bank of America, and JP Morgan Chase. In addition, partnerships are recommended with various

organizations for the dual purpose of training and job placement. Partners can be found at all levels and may include local community colleges, NYSERDA, the New York City Housing Authority (NYCHA), private foundations, and labor organizations. For example, the Clinton Climate Initiative (CCI), has recently launched a program whereby cities, ESCOs, and financial institutions are brought together to conduct large scale building retrofits. SSBx might attempt to partner with CCI to provide the labor for these projects.

Ultimately, G.R.E.A.T. has been designed to maximize the opportunities available for job creation and environmental stewardship. It is important to note, however, that both the curriculum design and job placement strategy were developed under current conditions. In terms of the previously mentioned potential barriers, G.R.E.A.T. will most likely need to be adapted over time. Fortunately, the program was designed with that imperative in mind. Various portions of the training curriculum may be removed or added, and job placement phases may be implemented or not, as requirements evolve. Numerous funding and partnership options are provided so that SSBx can choose entities with which to work as relationships change over time. Because G.R.E.A.T. is both flexible and comprehensive, SSBx has the potential to simultaneously help alleviate poverty through the creation of jobs while fostering a greener South Bronx community and New York City.

Figure III: Recommended Job Placement Strategy Timeline





Introduction



“It’s about getting our best brains out of hedge funds and into innovations that will not only give us the clean-power industrial assets to preserve our American dream...

A perceived trade-off exists between protecting the environment and maintaining economic growth. However, sustainability analysts refute this perception and argue that economic growth requires effective environmental stewardship.

In a *New York Times* article entitled “The Power of Green,” Thomas Friedman joins these sustainability analysts and maintains that “green” is not about cutting back. Rather, “going green” is “...about creating a new cornucopia of abundance ... It’s about getting our best brains out of hedge funds and into innovations that will not only give us the clean-power industrial assets to preserve our American dream but also give us the technologies that billions of others need to realize their own dreams without destroying the planet.”

This is the goal of the G.R.E.A.T. Program proposed in this report. The G.R.E.A.T. Program identifies opportunities to green, or make sustainable, job training programs. Relevant obstacles are also recognized and taken into account. This report also includes a recommended

business plan for the development of a green building retrofit program for Sustainable South Bronx.

Among the findings in this report is the idea that the creation of green collar jobs is a three-fold exercise to:

1. Analyze incentives for economic development in areas similar to the South Bronx;
2. Procure the equipment and technology necessary for sustainable development to be developed locally; and
3. Train workers in fields including green construction and retrofitting.

This emphasis on green jobs has the potential of transforming the environmental justice movement from a reactive mechanism, designed to reduce the impact of pollution on disadvantaged people, to a proactive and creative coalition that can further develop local economies while improving environmental quality.

...but also give us the technologies that billions of other need to realize their own dreams without destroying the planet.” -Thomas Friedman

This report was completed by twelve Masters Students at Columbia University’s School of International and Public Affairs (SIPA), who are studying Environmental Science and Policy. Faculty Advisor Gail Suchman, a lecturer at Columbia’s Law School and SIPA, and an environmental attorney at the law firm of Stroock Stroock and Lavan, led the project and the completion of this report.



CHAPTER 1

Background: Green Collar Jobs

An Emerging National Discussion

As public awareness of global climate change continues to grow and become accepted as a legitimate risk, so does the pressure on governments and private industry to combat this threat. Recently, the United States has passed national legislation that regulates greenhouse gases. In early 2008, for example, the Senate Environment and Public Works committee passed the Lieberman-Warner Climate Change Bill, which proposes achieving ambitious greenhouse gas reductions by cap-and-trade technologies, marking the greatest progress of national climate change legislation.¹ With a new administration entering the White House in January 2009, political analysts predict even greater progress.

is being used to build wind turbines. So now you can call them green jobs.”³

What is clear, however, is that a new “green” economy will require labor that cannot be outsourced to another country.⁴ This is Van Jones’s view, which is why his Ella Baker Center launched a national green collar initiative called “Green For All” in September of 2007, in partnership with SSBx, as previously noted. As the campaign states, “Green For All’s goal is simple—to secure \$1 billion in funding for green collar job training in order to lift 250,000 people out of poverty across the country. Green For All will be an organization unto itself, and will build on the successes of the Ella Baker Center’s green jobs campaign to grow a national green-collar jobs movement.”⁵

“A vocational job in an ecologically responsible trade.” -Van Jones

Furthermore, several lawmakers see the potential for integrating solutions for poverty and job creation with policies that address global climate change. The creation of a new green market sector promises to reframe the traditional understanding of environmental conservation and economic development as being mutually exclusive aims.

The term “green collar job” has roots that are unknown. However, Van Jones, a civil rights lawyer, co-founder of the Ella Baker Center for Human Rights in Oakland, California, and pioneer of the “green jobs movement,” describes the term as “a vocational job in an ecologically responsible trade, for instance: installing solar panels, weatherizing buildings, constructing and maintaining wind farms, materials re-use and recycling, doing organic agriculture, etc.”² As noted in a recent *New York Times* article, discerning the difference between “blue” and “green” collar jobs is not always clear, because the jobs may be substantively the same, but the product of labor fundamentally different. As the article states, “Dave Foster, executive director of the Blue Green Alliance, a partnership between the United Steelworkers and the Sierra Club, pointed to workers who mine iron ore in Minnesota and ship it to steel mills in Indiana. ‘Ten years ago, that steel was used for making low-efficiency automobiles, so those jobs were part of the dirty economy,’ he said. ‘But now that steel

Green For All may indeed be successful in its mission because federal funding for green collar jobs is on the rise. The Green Jobs Act, which passed as part of the 2007 Energy Bill, allocates \$125 million annually for green job training programs for 35,000 people a year to work in environmentally-friendly fields:

- \$25 million will be allocated to create “green pathways out of poverty,” that is, job training for low-income individuals in fields including solar power installation and green roof installation;
- \$80 million for green job re-training: teaching construction workers competency in green construction techniques, for example; and
- \$20 million for renewable energy and energy efficiency research.⁶

Perhaps more significantly, green collar jobs have been featured on the presidential campaign trail. Former presidential candidate John Edwards, for example, made green collar jobs a central component of his presidential campaign, stating that “we can turn the crisis of climate change into an opportunity for a new energy economy, right here in America.”⁷ Current frontrunners Senators Hillary Clinton, Barack Obama and John McCain continue to promote green collar jobs. Senator Clinton promises to adopt policies that will incorporate green collar jobs into the national agenda. Senators Obama

and McCain state that they believe green jobs have the potential to create millions of new jobs in the next two decades.

A Growing Market: Trends in Green Building Retrofits and Auditing

National legislation has been heavily focused on increasing the efficiency in both the transportation and electric generation sectors. However, there has been increasing recognition of the overall energy usage of buildings. This is significant because there is a direct link between climate change, greenhouse gas emissions and energy use: Increased energy use increases greenhouse gas emissions, because the majority of today's energy sources are fossil fuel-based (oil, coal and natural gas). Greenhouse gas emissions contribute to global climate change and therefore, the efficiency of buildings, which account for 30 to 40 percent of global energy use, must be reevaluated.⁸ As noted in Figure 1, it is apparent that building energy usage is expected to increase

worldwide, in both the commercial and residential building sectors.

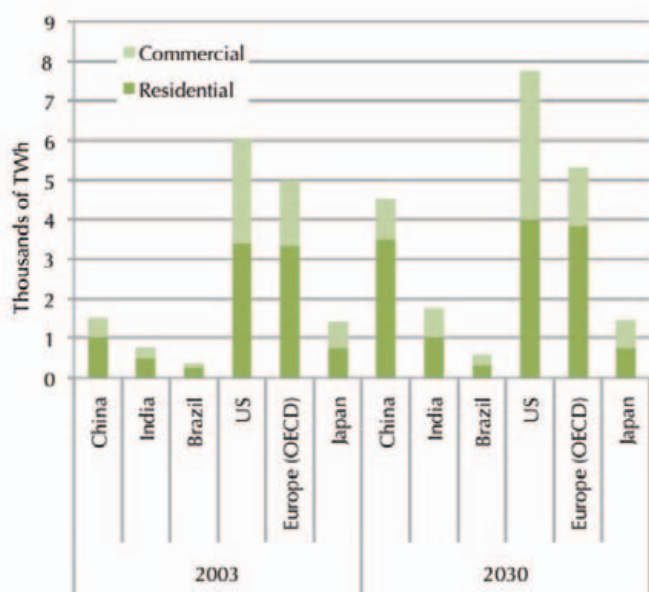
It is estimated that the global building sector could reduce CO₂ emissions by 1.8 billion tons.¹⁰ However, a more aggressive energy efficiency policy may call for energy reductions of over two billion tons, or close to three times the amount planned to be reduced under the Kyoto Protocol.¹¹

New York City's contribution to global climate change is significant by virtue of its sheer size. According to PlaNYC, New York City was responsible for the emission of 58.3 million metric tons of carbon dioxide equivalent (CO₂e) in 2005.¹² Over two-thirds of New York City's energy is used in buildings: 79 percent of the City's total greenhouse gas emission quota is attributable to its buildings as noted in Figure 2. This is a direct reflection of the operational inefficiency of the City's building stock.

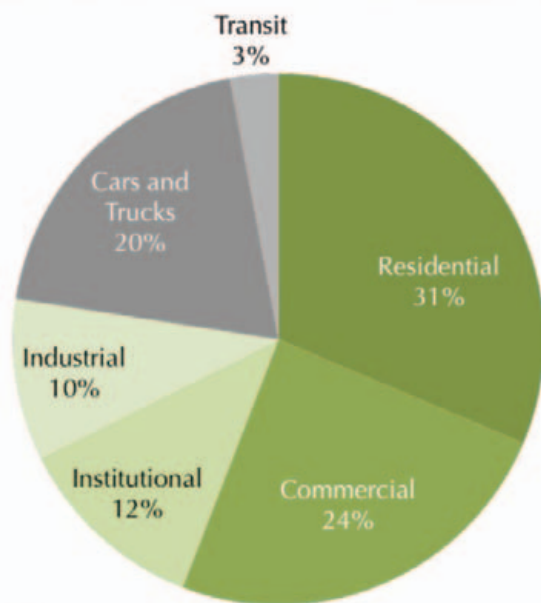
It is estimated that by 2030, this percentage will increase to 85 percent, and currently existing buildings are chiefly responsible for these emissions. As a result, a major focus of PlaNYC is to improve the operational efficiency of the City's existing building stock.¹³

Another incentive is cost: New York State's electricity costs are among the highest in the nation, averaging 20.91 cents per kilowatt hour.¹⁵ As a result, New York could be one of the first states in the United States where existing electricity costs will be equivalent to those of alternative energy costs, predicting a somewhat smooth transition to alternative energy, provided such technologies are available for the urban setting.¹⁶ Figure 3 delineates the total energy usage by building type in New York City. Commercial and multi-family residential buildings, which tend to be among the oldest in the City, account for over 50 percent of total energy used by New York City buildings.

Figure 1: Building Energy Projection by Region



Source: WBCSD¹⁴

Figure 2: New York City's Total Emissions by Sector, 2005

Total: 58.3 million metric tons

Source: New York City Mayor's Office of Long Term Planning and Sustainability¹⁹

Indicator of a Growing Trend: Growth in Standards for Green Building

In an effort to reduce the energy usage of the nation's buildings, the green building movement has gained momentum. The inception of the United States Green Building Council (USGBC) in 1993 was a milestone in the green building sector. To this end, the USGBC premiered its groundbreaking Leadership in Energy and Environmental Design (LEED) Green Building Rating System in 1998. Soon after, the green building movement exploded, as municipal, state and federal agencies began to establish standards and guidelines, tax incentives, and governmental regulations to encourage green practices.¹⁸ As of December 2007, there were 17 LEED certified projects and 311 LEED registered projects in New York City, as depicted in Figure 4.¹⁹

As the green movement continues to gain momentum, so too does the increase in consumer demand for greener, more sustainably built homes, schools and offices. This, in turn, has led to the emergence of green building certification programs. Part quality control monitor, part information provider and part marketing agency, these certification programs continue to play a key role

in legitimizing and standardizing national standards and guidelines. "A home certified as green by a reliable organization gives the public an added confidence in the product, increasing demand for sustainable homes and helping green builders to distinguish themselves in the marketplace."²⁰

National Standards and Guidelines

The following is a list of the current national standards and guidelines that have been implemented thus far in New York and in the United States.

United States Green Building Council (USGBC)

Since its establishment in 1993, the USGBC has seen exponential growth in its membership, demonstrating widespread growth and dedication to the green building industry. As of February 2008, its membership included over 13,500 member organizations consisting of corporations, governmental agencies and nonprofits.²¹ USGBC's LEED Green Building Rating System is quickly becoming the official standard in the United States. The USGBC is now offering service provider individuals with accreditations to act as consultants to aid clients in the LEED certification process. Since the launch of the Accredited Professional Program in 2001, there have been 42,000 individuals who have become accredited nationwide.

National Association of Homebuilders Model Green Home Building Guidelines

The National Association of Homebuilders (NAHB) Model is designed to be a resource for local home building associations wanting to start a green building program in their area.²² "By the end of 2007, more than half of NAHB's members, who build more than 80 percent of the homes in this country, will be incorporating green practices into the development, design and construction of new homes."²³

Figure 3: Energy Usage by Building Type in New York City

Percent of total energy in British Thermal Units (BTU)

Building Type	Heat	Hot Water	Lighting	Appliances*	Cooling**	Other	Total
1-4 family residential	7.6%	2.6%	1.7%	2.2%	0.6%	0.0%	14.7%
Multi-family residential	7.4%	7.4%	3.0%	3.9%	1.2%	0.0%	22.0%
Commercial	8.5%	2.8%	10.2%	4.5%	4.5%	0.9%	31.4%
Industrial	2.6%	2.1%	4.0%	3.3%	1.1%	0.2%	13.0%
Institutional/government	6.3%	4.0%	3.6%	1.7%	1.4%	0.9%	17.9%
ALL TYPES	32.4%	18.9%	22.5%	15.6%	8.8%	2.0%	100.0%

SOURCE: plaNYC

*Appliances include electronics and refrigerators, as well as other appliances

**Cooling includes ventilation as well as air conditioning

Source: Con Edison, United States Department of Energy; New York State Energy Research and Development Authority²²

Natural Resource Defense Council Green Building Guidelines

The Natural Resource Defense Council's Green Building Guidelines serve as an online resource for building professionals, helping them through the green building process, ranging from design and marketing to construction.²⁴

New York State Green Building Tax Credit

"The Green Building Tax Credit provides tax credits to owners and tenants of eligible buildings and tenant spaces which meet certain 'green' standards. These standards increase energy efficiency, improve indoor air quality, and reduce the environmental impacts of large commercial and residential buildings in New York State, among other benefits."²⁵ The total amount of money available to be issued is \$25 million.

New York City Department of Design and Construction: Sustainable Design

In 1999, the New York City Office of Sustainable Design published its own "High Performance Building Guidelines," encouraging green building methods to be used for municipal projects. As of January 2007, 25 city-wide projects have adhered to these guidelines, with construction costs totaling about \$950 million.²⁶

Battery Park City Authority: Green Guidelines

The Battery Park City Authority published residential green building guidelines in January 2000, thus becoming one of the first authorities to establish a process for the creation of environmentally responsible residential buildings. These guidelines were used in the construction of the first green residential tower in the United States, The Solaire. The Authority followed up with a set of commercial and institutional guidelines in March 2002.²⁷

Additional Local Incentives

In addition to tax credits, New York State is also pursuing energy efficiency in buildings through the public benefit corporation, New York State Energy Research and Development Authority (NYSERDA). NYSERDA is funded by energy rate payers in New York State and is focused on research to reduce energy usage and to promote the economic and environmental well being of New York. A number of incentives are offered for home and building owners to promote energy efficiency. See Appendix X for additional information.

Anticipating Greener Building Codes for New York City

For the first time since 1968, building codes in New York City are being revised to include energy efficient and water saving requirements in all New York City buildings, which can potentially increase the demand for retrofits in the next five to ten years.²⁸

For example, Initiative 3 of PlaNYC's Energy Plan recommends strengthening the City's energy and building codes: "While the new code will include a number of green elements—including rebates for some green building features, requirements for cool (white) roofs and energy code certification, and more stringent ventilation standards—more can be done. We will make 'greening the code' a central focus of the next revision cycle, with an emphasis on implementing the City's energy efficiency strategies, streamlining the process for incorporating new, sustainable technologies into construction, and adaptation to climate change."²⁹ Areas of concentration will include upgrades in lighting systems and energy-efficient appliances, peak load management programs and the installation of "smart meters", which enable buildings to track their own energy use in real-time.³⁰

Incentives: Green Buildings Save Money

According to a USGBC study, the upfront costs of some green buildings may be similar to or less than prevailing construction prices, due to resource efficiency and more

appropriately sized mechanical, electrical and structural systems.³² The study shows that in conventional buildings, these systems tend to be oversized, and thus more expensive and less efficient.³³

The financial benefits of green buildings include the money saved from lower energy use, more efficient waste disposal, lower water usage, lower environmental and emissions costs and lower operations and maintenance costs. Estimating these cost savings can be fairly straightforward in the case of energy, waste, and water savings, but savings also occur from secondary benefits such as greater productivity and better overall health.

The USGBC states: "In the United States alone, buildings account for:

- 65 percent of electricity consumption;
- 36 percent of energy use;
- 30 percent of greenhouse gas emissions;
- 30 percent of raw materials use;
- 30 percent of waste output (136 million tons annually); and
- 12 percent of potable water consumption."³⁴

Reducing the quantity of resources used in existing and new buildings has direct environmental and financial benefits. Some of these benefits, as applied to the existing building stock in New York City, are further discussed below.

Figure 4: Proliferation of LEED Projects in New York City

Borough	LEED Certified		LEED Registered	
	Total Ft ²	Total No. Projects	Total Ft ²	Total No. Projects
Manhattan	4,697,654	12	73,085,774	199
Brooklyn	63,000	1	23,283,057	58
Queens	2,321,051	2	13,017,753	25
Bronx	136,764	2	4,529,447	19
Staten Island	0	0	927,674	10
TOTAL	7,218,469	17	114,843,705	311

Source: USGBC

Benefits of Green Building Retrofits

As previously stated, green building retrofits create monetary savings from lower energy use, more efficient waste disposal, lower water usage, lower environmental costs and lower maintenance costs. The following list describes these and other benefits in greater detail.

Energy Cost Savings

As one of the top incentives for building owners to build green or retrofit, increased efficiency accounts for substantial cost savings for businesses and individuals by lowering energy bills. Energy efficiency investments currently save United States consumers and businesses

\$650 billion per year in avoided energy costs, savings that could potentially be used to fund future efficiency projects.³⁵ However, it is important to note that while these savings are significant, considerable improvements can still be made.

Water Savings

Access to clean water is currently an issue in many areas. Thus, water conservation and efficiency is vastly important. Over the past decade, technology in the water conservation sector has improved dramatically. Original efficient toilets saved up to 3.5 gallons per flush, while the newest models can conserve up to four gallons. One-gallon urinals were considered “best

Figure 5: Green Building Codes - Selected Municipalities³⁶

<u>Boston</u>	Boston Zoning Code (2007): LEED certified mandatory for private construction of at least 50,000 ft ²
<u>Chicago</u>	The Chicago Standard (2004): Residential: 50 percent Green roof & EnergySTAR certification for buildings with >4 units. Commercial: Retail over 10,000 ft ² 50 to 75 percent green roof OR 25 to 50 percent green roof and LEED certified. Two offices over 80 ft., 75 to 100 percent green roof.
<u>San Francisco</u>	Green Communities Grant (2005): \$300,000 for six low-income housing projects Proposed Green Building Codes, to be approved by city council (2008): Mandatory LEED Gold by 2021 for new residential buildings higher than 75 ft, new commercial buildings larger than 5,000 ft ² and renovations to buildings larger than 25,000 ft ² .
<u>Washington, DC</u>	Green Building Act (2006): LEED certified mandatory for public and private construction of at least 50,000 ft ² . Specific requirements include: • Increase minimum energy efficiency by nearly 30 percent • Increase water efficiency by requiring low-flow plumbing fixtures • Require white or green roofs to reduce the urban heat island effect • Prohibit recirculation of air vented from bathrooms and kitchens

Green Building Codes Throughout The Nation

New York City is not alone in its attempt to green its buildings. Figure 5 highlights four cities – Boston, Chicago, San Francisco and Washington, D.C. – in the United States that have taken the lead and have implemented green building codes.

**Figure 6: Financial Benefits of Green Buildings
(per ft²)**

Category	20-year NPV
Energy Value	\$5.79
Emissions Value	\$1.18
Water Value	\$0.51
Waste Value (construction only) – 1 yr	\$0.03
Commissioning O&M Value	\$8.47
Productivity and Health Value (Certified and Silver)	\$36.89
Productivity and Health Value (Gold and Platinum)	\$55.33
Less Green Cost Premium	(\$4.00)
Total 20-year NPV (Certified and Silver)	\$48.67
Total 20-year NPV (Gold and Platinum)	\$67.31

Source: Capital E Analysis

technology” during the 1990s but today half-gallon urinals are mainstream, one-pint urinals are on the market and non-flush urinals are available.³⁶

Other Environmental and Health Benefits

Green building retrofits recognize the impact of the built environment on ecosystems and surrounding areas, and thus aim to minimize such impacts. Increasing efficiency not only reduces greenhouse gas emissions and other pollutants by decreasing reliance on fossil fuels, but also bolsters investments in innovative technologies, such as sources of clean renewable energy, eco-friendly cleaning products and paints and water conserving fixtures.

In addition, minimizing these impacts and increasing investments in innovative technologies provide health benefits. For example, indoor air quality is improved by green building technology. Over 500,000 New Yorkers - six percent of the population - have asthma. About 35,000 New Yorkers go to the hospital with asthma attacks each year.³⁷ The hospitalization rate for asthma attacks in New York City is twice the national average, and in some areas, like East Harlem and the South Bronx, the rate is nine times the national average. Overall, the hospitalization rates caused by asthma attacks have increased by 22 percent between 1988 and 1997.³⁸

Thus, enhanced air quality is paramount for improving the health of New York City’s residents and reducing health care costs. High-performance green buildings typically offer improvements to indoor environments that can reduce health care costs and work losses from

communicable respiratory diseases by 9 to 20 percent, from allergies and asthma by 18 to 25 percent and from other non-specific health and discomfort effects by 20 to 50 percent.³⁹ In addition, a Lawrence Berkeley National Laboratory study found that such improvements would generate savings of \$17 to \$48 billion annually in lost work and health care costs.⁴⁰

Reinvestment and Industry Development

National studies have linked energy efficiency cost savings to business reinvestment, economic growth, and job creation, a phenomenon known as the “multiplier effect.”⁴² Efficiency is now being treated as a developing market, which relies on a broad array of evolving industries, from the manufacturing of efficient appliances to the research and development of efficient building materials. In terms of New York City, “Having a viable green workforce in New York City could serve as a magnet to attract complementary services and manufacturers of green products.”⁴³

Affordability

Low-income individuals spend a disproportionate percentage of their earnings on utilities. Reducing these costs constitutes an important step toward keeping housing affordable.⁴⁴

Growing Number of Green Buildings Will Require More Labor

In addition to the benefits listed above, the proliferation of green buildings throughout New York City and the rest of the nation will require additional labor, thus stimulating the economy and creating jobs.

The New York Office of the State Comptroller estimates that total job growth from renewable energy, including direct jobs, indirect jobs, jobs created in related industries and job creation from increased household spending, will result in about 43,000 additional new jobs statewide by 2013.⁴⁵

In a 2004 study by the University of California at Berkeley, researchers concluded that “the renewable energy sector generates more jobs per megawatt of power installed, per unit of energy produced, and

per dollar of investment, than the fossil-fuel-based energy sector.” The study estimated that transitioning 20 percent of the nation’s electricity generation from carbon-generated electricity to renewable sources by 2020 will result in the creation of 101,000 to 157,000 additional jobs in the United States.⁴⁶ Thus, “the cleantech market is a potential source of new jobs and offers attractive growth prospects. The alternative energy segment in particular will also be a significant source of diverse types of jobs, from technology and manufacturing to professional services.”⁴⁷

Even though these findings are promising, the benefits associated with green buildings and retrofitting and the overall carbon intensity of non-retrofitted buildings has yet to resonate with many Americans. Whether it is from simply a lack of accurate information or from dissemination of misinformation, only 7 percent of American voters identified buildings as the top contributor of greenhouse gas emissions in a recent

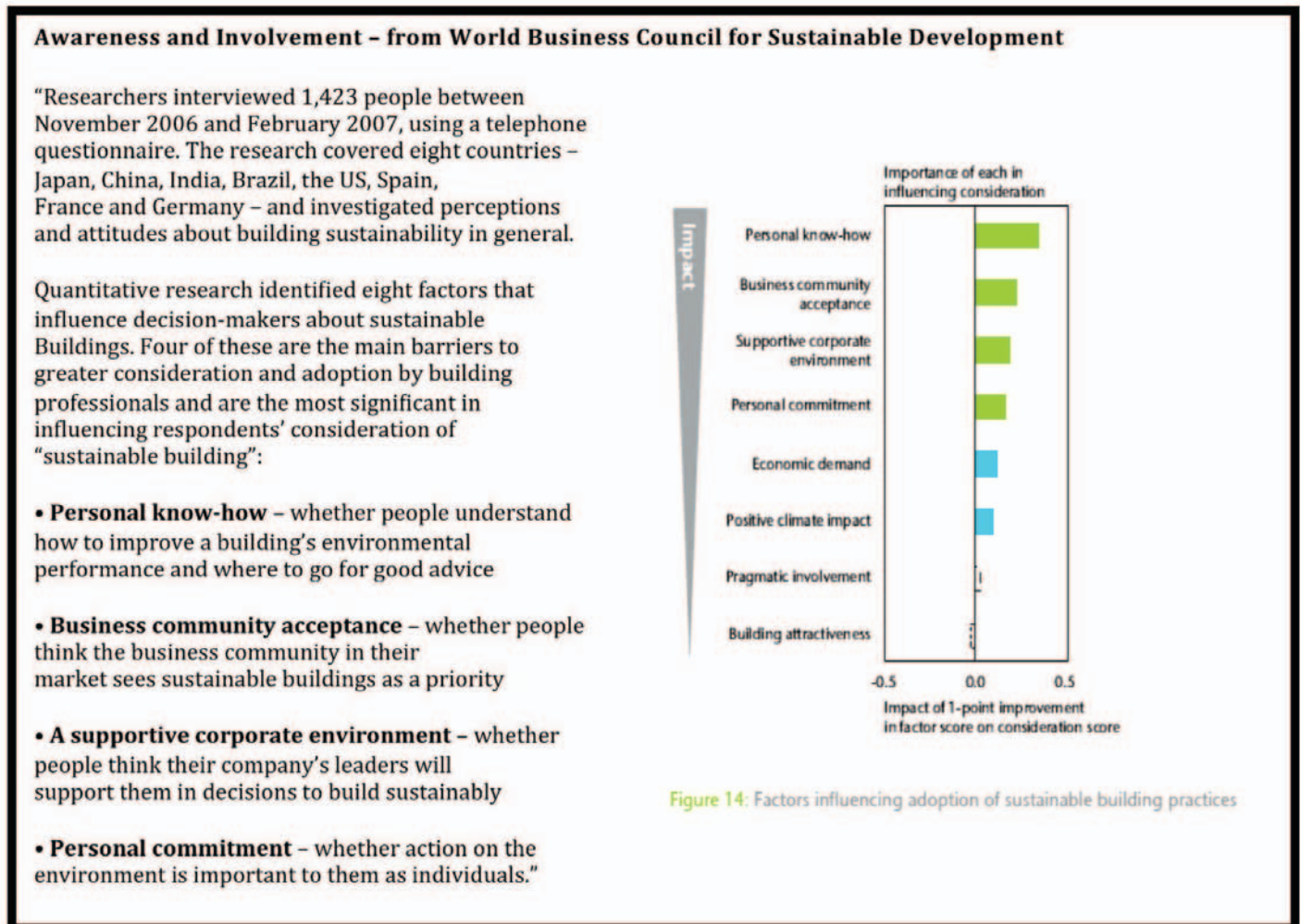


Figure 7: Awareness and Involvement Schematic from the World Business Council for Sustainable Development

Source: World Business Council for Sustainable Development

Benefits of the Training Program

In addition to benefits associated with green buildings and building retrofits, there are specific benefits connected to the training program. These benefits can be broken down first, into South Bronx community-specific benefits, and second, into more general environmental, community and financial benefits.

Community Benefits: Sustainable South Bronx

Studies have shown the environmental and economic benefits of green building and building retrofitting. Additional studies have shown that trends in green building will require an increased labor force to complete retrofits and construction. Yet there is another, often neglected benefit of green building and building retrofits that can be achieved through the convergence of these two trends: community benefits. The South Bronx is one such community that can reap the benefits of a green collar job training program for building retrofits.

The South Bronx is a heavily industrialized area of New York City and suffers from a severe lack of green space. The area accounts for 40 percent of the Bronx's population of 522,412 people. Of this population, 7.9 percent (41,270 people) were unemployed as of August 2007.⁵⁰ By contrast, the United States unemployment rate is 6.4 percent.⁵¹ In 2005, annual income was 37 percent lower than the national average.⁵² In Hunts Point (area 17 in Figure 9), a neighborhood located in the South Bronx, 52 percent of residents have not completed high school or the equivalent of high school (GED).⁵³ In 2005, the poverty rate was 47 percent in Hunts Point and 29 percent in the Bronx as a whole.⁵⁴ Hunts Point and the South Bronx in general have one of the highest poverty rates and lowest median household income levels in New York City.

Environmental Benefits

Trainees will receive hands-on retrofit training in local buildings, which will improve the overall environmental health and sustainability of the South Bronx.

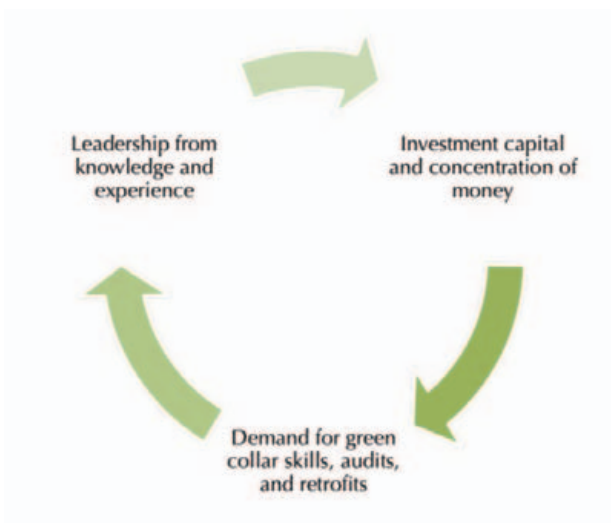


Figure 8: Synergistic Relationship Between Leadership, Investment Capital and Demand for Green Collar Skills

poll by the American Institute of Architects (AIA).⁴⁸ It is important to understand the link between the knowledge base and the current demand. Many locales are taking steps to actively induce demand through regulations (see Chapter 1, pages 11 through 17 for additional green building information). In many cases, a comprehensive approach that creates synergies between economic development, policy-induced demand and leadership grounded in knowledge and experience is missing.⁴⁹ Thus, regions should foster leadership by coordinating local and regional agencies and community groups to disseminate knowledge and develop innovative ideas on how to translate incentives and policies into economic development. Figures 7 and 8 further illustrate this point.

General Community Benefits

- Provides employment to an underserved population;
- Nurtures confidence, social skills and sense of ownership; and
- Provides education in fundamental marketable skills in an interactive, hands-on, inquiry-based manner. The local workforce lacks critical employment skills, including oral and written communication skills, administrative skills and technical skills, required for most professional certifications.

Financial Benefits

If Hunts Point and other South Bronx residents are taught marketable skills and subsequently enter the job market, the economy and job market will be stimulated, poverty will decrease and median household income will increase.

Sustainable South Bronx Can Tap Into The Growing Green Building Market And Green Collar Job Sector

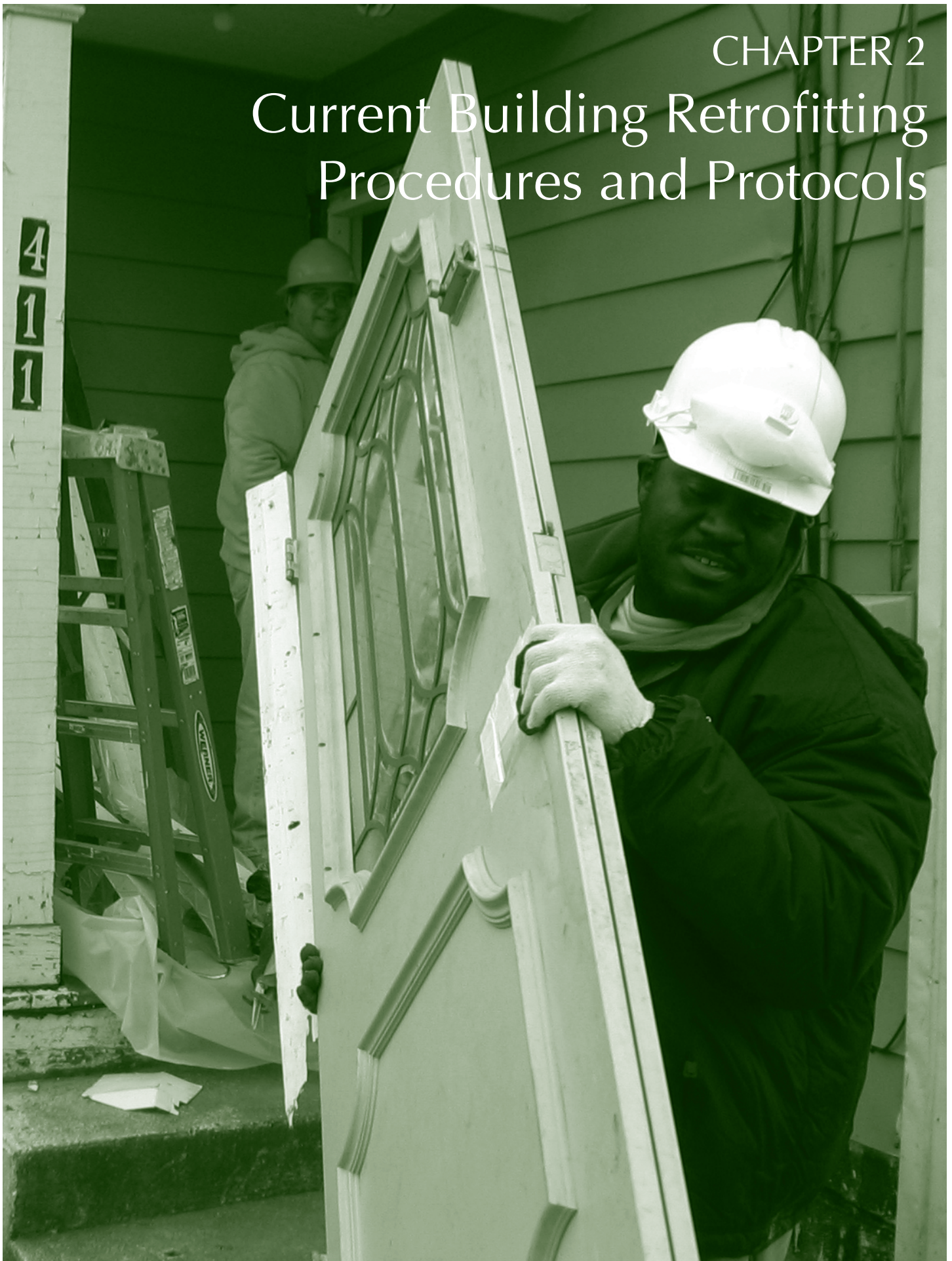
Sustainable South Bronx can access the growing demand for green buildings and green collar jobs by training South Bronx residents in skills necessary for jobs in construction and building retrofits. This will simultaneously help alleviate poverty within the South Bronx community by stimulating the local economy and job market, in addition to helping lessen the effects associated with global climate change.



Figure 9: Map of South Bronx (Source: Gotham Gazette)⁶⁰

CHAPTER 2

Current Building Retrofitting Procedures and Protocols



Current building retrofit procedures and protocols serve as valuable background for the training program. For the purposes of this report, the discussion and research on these protocols and buildings in general will be limited to residential buildings. Residential buildings are not owned and maintained by commercial entities and examples include single- and multi-family homes, apartment buildings, condos and co-ops.

In general, building retrofits increase energy efficiency and reduce consumption of water through a number of different methods and technologies. The energy consumption of a residential building can be reduced through sealing the building's exterior using energy efficient appliances, and upgrading the heating, cooling and lighting systems. Water consumption can be reduced by the use of high-efficiency plumbing fixtures and reduced water landscaping. Additionally, storm water mitigation can be achieved through green roof installation, use of permeable materials for exterior surfaces and rainwater harvesting.

Performance Audit

A performance audit is the initial phase of a building retrofit to improve energy efficiency and reduce water use at home. It is comprised of a traditional energy audit with three additional services: a blower door test, an infrared scan of the building envelope, and a combustion safety test of the heating system. These services measure and pinpoint air leakage and moisture problems within a home, and provide the customer with specific suggestions for improvements.

Auditing Process: Assessment and Contracting

A home performance audit is divided into an assessment phase and a contracting phase.

Assessment

A comprehensive home assessment, which can potentially last up to three hours, provides valuable information regarding the existing condition of a building. In addition, it identifies areas where energy efficiency, water use reduction, comfort and safety

improvements are feasible and recommended. During the comprehensive home assessment, the auditor completes a visual inspection of the residential space and performs a number of tests using diagnostic equipment. Accredited auditors are trained to use equipment such as a blower door, which helps the auditor measure where and how much air is leaking from a home. The auditor also conducts an infrared scan of the building envelope using a specialized infrared camera, and monitors total leakage using a device called a digital manometer. Most importantly, the auditor performs essential health and safety tests to determine whether the major combustion appliances (furnace, boiler, hot water tank and stove) are operating safely and efficiently.

Contracting

The assessment fees vary by contractor and region and most have a deductibility policy, that is, the assessment fees may be tax deductible. Some provide a number of financing options designed to help pay for the efficiency upgrades. Once the customer decides which upgrades to install, the customer is presented with a written contract to review and sign. Contractors are then designated to install the requisite upgrades in the home. Final tests are generally conducted for performance control and compliance with program standards.

Auditors frequently identify duct leakage points, construction gaps, ventilation and insulation deficiencies and HVAC performance problems that can be adjusted. The most common audit recommendations include sealing air leaks, adding insulation, upgrading lighting and appliances and switching to renewable energy systems, such as solar electro (photovoltaic) or solar hot water. The customer is provided with a detailed written report and graphs of the findings and recommendation for improving the durability, energy efficiency and water use reduction of the building, based on estimated costs and payback.

National and Local Programs and Resources

The following list describes national and local resources and programs for home performance auditing and certified auditors:

- Home Performance with Energy Star is a national program from the United States Environmental Protection Agency and Department of Energy which

offers a comprehensive approach to improving energy efficiency and comfort in homes.

- Long Island Power Authority's (LIPA) Home Performance with Energy Star Program created a network of independent home improvement contractors that are accredited by the Building Performance Institute.
- Building Performance Institute (BPI) is a national resource for building science technology that sets standards for assessing and improving the energy performance, as well as the health and safety of buildings.

BPI Certification

Building Performance Institute – Home Performance Certification

The Building Performance Institute (BPI) offers a number of nationally recognized certification and training programs related to green retrofits. Most notably, the Home Performance with Energy Star certification program trains contractors in energy efficiency and other home improvements in accordance with Energy Star standards set by the Department of Energy and the United States Environmental Protection Agency. The basic level of certification offered by BPI is as a Building Analyst Professional. Building Analyst Professionals learn basic building science and how to use diagnostic equipment to assess building performance. These professionals may then train to become BPI Specialists who learn more specialized skills in areas including HVAC and Building Envelope. BPI accreditation is also available for companies that employ BPI certified contractors. Training is conducted by local BPI affiliates.

BPI certification is a rigorous, credible, and defensible written and field examination process administered to individuals by BPI or its affiliates, to prove knowledge, skills and professional competency in the building performance industry designations. Each examination set is crafted to ensure that the credential holder can properly evaluate critical performance parameters of a building that will impact health, comfort, safety, reliability, durability, efficiency and performance. BPI certifications also ensure that the candidate understands the interaction of specific building systems with other

building systems so that it does not create conditions that are harmful to life, limb or property.

Candidates attempting to earn a BPI certification for the first time, who have not earned any other designation, must register for the written and field examinations. In addition, candidates are administered a 100 question written examination that covers certain fundamentals of building science, as well as knowledge specific to the designation being attempted.

BPI strongly encourages formal training prior to examination, yet there are no prerequisites. BPI does not directly develop or conduct training for certification candidates. However, BPI Recognized Training has been proven to align with the BPI Knowledge Areas, BPI Knowledge Essential Task List (KETL) and BPI National Standards. It can prepare candidates for BPI certification and is made available by industry organizations, such as BPI affiliates or other supporters of BPI.

Specialized certifications beyond Building Analyst for small homes (one to four residential units per building) include: Envelope Professional; Manufactured Housing Professional; Heating Professional; and Air Conditioning (A/C) or Heat Pump Professional.

BPI also offers specialized certifications for work on multifamily buildings (typically over five residential units) beyond the basic Building Analyst certification. These certifications include: Energy Efficient Multifamily Building Operations Specialist; Multifamily Hydronic Heating System Design Professional; and Multifamily Advanced Heating Plant Technician.⁵⁶

In addition to individual certification, BPI offers an accreditation program for businesses. In order to become accredited, an organization must submit an application with supporting documentation detailing their eligibility.⁵⁷ In order for a business to be eligible, it must employ a minimum of one BPI certified individual, maintain \$1 million in general liability insurance and maintain registrations and licensing as required by state and local agencies.⁵⁸ Once an application package is complete, a business must then agree to periodic field verification reviews, paid for by BPI. After this review period, the organization then enters into a formal Accreditation Agreement with BPI and must conform to required practices to remain accredited.

Building Retrofit Technologies: Energy Efficiency and Water Use Reduction

There is a range of efficiency technologies currently available on the market that can be used in building retrofitting. These technologies are available in a range of costs and installation complexity. The technologies have been grouped into three tiers. The three technology tiers are ranked according to ease of installation for a homeowner or resident.

Efficiency Technologies and Recommendations: Tier One

Tier One consists of a checklist of upgrade recommendations that can be easily purchased, installed, or otherwise met, as the first step in a residential building's upgrade process. Tier One technologies can be implemented by the resident.

Use of Energy-Efficient Appliances and Equipment

One of the easiest ways to reduce energy consumption is to install and use ENERGY STAR products. These products meet a high level of energy efficiency, which can save \$80 per appliance per year in utility costs and use 10 to 50 percent less energy and water than standard models. Qualified Energy Star products that are used in a residential building are clothes washers, dehumidifiers, dishwashers, refrigerators, freezers, room air conditioning and room air purifiers.⁵⁹ Energy Star heating and cooling products are also available and include air-source heat pumps, boilers, central air conditioning, ceiling fans, dehumidifiers, furnaces, geothermal heat pumps, insulation, programmable thermostats and ventilating fans.

Lighting – CFL Use and Fixture Replacement

Compact fluorescent light bulbs (CFLs) have a much longer bulb life than conventional incandescent light bulbs and only use a fraction of the energy. According to the USGBC, \$100 per year can be saved by changing only five of the most frequently used bulbs in a building.⁶⁰ Energy Star light fixtures can also reduce

energy consumption, using only a quarter of the energy of traditional lighting.⁶¹

Thermostat Settings

The recommended settings for a residential thermostat is 78° F or higher in the summer and 62° F or lower in the winter. Using these recommended temperatures can reduce energy use.⁶²

Use of Flow Reduction Aerators and Low- Flow Showerheads

Installing aerators to faucets and changing to low-flow showerheads will reduce the amount of water consumed. These products are readily available at most hardware stores.⁶³

Certifications/Licenses Required for Installation

No certifications or licenses are required for Tier One retrofits.

Efficiency Technologies and Recommendations: Tier Two

Tier Two uses technology that requires professional installation and is recommended as a “second pass” in the upgrade process.

Energy-Efficient Building Envelope – Sealing Exterior

Energy efficiency can be achieved through sealing leaks around windows, doors and other wall penetrations. This will maintain the desired indoor temperature and lower heating and air conditioning costs. The leaks are easily sealed through the use of weather stripping and caulk.⁶⁴

Energy-Efficient Building Envelope – Window Replacement and Insulation

Replacing windows and adding insulation prevents heat loss in winter and heat gain in summer. Energy Star certifies windows to ensure maximum efficiency.⁶⁵

Demand or Tankless Water Heater

Another technology that can be used to reduce electricity use is demand, or tankless, water heaters. Demand heaters are found to be at least 8 to 14 percent

more efficient than storage tanks, even in high-water-use homes (about 86 gallons per day) by the National Renewable Energy Laboratory (NREL). These water heaters were 24 to 34 percent more efficient in low-water-use homes (about 41 gallons or less per day).⁶⁶

HVAC Efficiency

The HVAC system should be tuned every two years to ensure efficiency.⁶⁷

Lighting Occupancy Sensors

Lighting occupancy sensors are indoor lighting controls that can reduce energy consumption by turning lights on and off by detecting activity within a certain area. Two types of occupancy sensors exist: ultrasonic and infrared. Infrared sensors detect heat and motion to activate and ultrasonic sensors use sound.⁶⁸

Smart Meters

Smart Meters are advanced utility meters that are designed to convey to customers more useful information about their energy use. These meters can inform a homeowner when electricity is most expensive (during peak demand) to allow for better energy management. They can cost up to \$600 (a typical meter is about \$30), but are becoming more common as utilities attempt to better inform their customers on how to improve their energy efficiency in order to lower costs.⁶⁹

High-Efficiency Plumbing Fixtures

Replacing existing fixtures with high-efficiency plumbing fixtures will reduce the water consumption of the building. The United States Environmental Protection Agency developed a program called WaterSense, which labels water-efficient products such as high-efficiency toilets and faucets.⁷⁰

Storm Water Mitigation

Building retrofits do not traditionally include storm water mitigation. However, this training program may consider including these technologies, such as landscaping with native plants, which minimize storm water runoff as well as replace the use of high-maintenance plants such as turf grass. Rainwater can also be harvested and used as gray water in plumbing and irrigation systems.

Certifications/Licenses Required for Installation

In order to perform most residential green building audits, New York City requires contractors to hold current Home Improvement Contractors licenses. This license covers work being performed on one to four family-sized dwellings, or on individual units or condos within multiple family dwellings regardless of size. This certification is provided by the city government and requires applicants to pass an exam.⁷¹

National Association of the Remodeling Industry (NARI) – Green Remodeling Education

NARI's Green Remodeling Education Program focuses on energy efficiency, but covers additional topics including building science, green remodeling guidelines, application of solar technologies, appliance selection and how to market a green business.⁷²

Association for Energy Affordability

This Bronx not-for-profit organization provides training programs in weatherization to address energy efficiency needs of small homes and multifamily apartment buildings. The training programs adhere to BPI standards.⁷³

Other Training

Specific HVAC training for contractors is available at a number of local trade schools.

Many green retrofit technologies (electric lighting, heating, and ventilation) are electrical in nature and may require a licensed electrician to perform the work. New York City licenses electricians in two categories: Master Electrician and Special Electrician.⁷⁴

There are training programs available at universities as well as trade schools where electricians can learn the skills necessary to pass the electrician license examinations. Training tends to include instruction in wiring, installation, design and more advanced applications.

Efficiency Technologies and Recommendations: Tier Three

Tier Three includes renewable energy technologies, the application of green roofs, and major plumbing renovations. These technologies may be more difficult or expensive to implement in existing buildings and thus market demand tends to be lower, but stands to increase in the near future. Tier Three technologies require a team for installation.

Renewable Energy Sources – Solar Power

Photovoltaic panels placed on roofs can convert sunlight into electricity or heat for use in residential buildings.⁷⁵ PlaNYC includes the creation of property tax abatement for solar panel installations and, pending the approval of this abatement, can be a viable and profitable technology for this training program.⁷⁶

Solar Water Heating

Solar water heating reduces the need for conventional water heating by about two-thirds. Active solar water heaters circulate water or other heat-transfer fluids through the use of electric pumps and controllers to a collection container. Passive solar water heaters rely on gravity and the tendency of water to naturally circulate as it is heated. Passive systems contain no electrical components, are generally more reliable, are easier to maintain and possibly have a longer work life than active systems.⁷⁷

Green Roofs

Green roofs reduce urban heat island effect and protect roofing material from UV exposure and extreme temperatures. This protective layer insulates the building and keeps the building interior cool in the summer, thus reducing energy use. Additionally, green roofs absorb air pollution, collect airborne particulates and store carbon as well as large amounts of rainwater, which reduces the overall sewer system load during rainstorms.⁷⁸

Certifications and Licenses Required for Installation

Renewables

The installation of renewable energy technologies like solar photovoltaic cells and solar-thermal heating systems sometimes requires advanced electrical skills, but does not require specific certification. The North American Board of Certified Energy Practitioners (NABCEP) offers voluntary certification to distinguish electricians and contractors from their competitors. Certifications are available for photovoltaic installers and solar thermal installers.

The Center for Sustainable Energy at Bronx Community College offers training programs for those seeking NABCEP certification in installation of photovoltaic panels. Introductory and Advanced courses are taught in collaboration with New York Design at LaGuardia Community College and New York City Tech.⁷⁹

Plumbing

Installation of water efficiency devices within the plumbing system, such as tankless water heaters and grey water reclamation, may require a New York City plumber's license. Training for plumbers is available at Bronx Community College and at many local trade schools.⁸⁰

Building Retrofit Technology: An Integral Part of the Training Program

It is apparent that building retrofit technology and protocols are comprehensive and are becoming well-established. Being familiar with these technologies and protocols is important because associated time commitments, costs, mandatory certifications and retrofit procedures must be taken into account when designing a successful retrofit training program. Moreover, this familiarity allows for a decision to be made on the duration of the training program and how many students can be enrolled in the program at a given time.

CHAPTER 3

Partnerships



In addition to technology, partnerships are an essential component to building retrofit training programs. By defining potential partnerships, Sustainable South Bronx will gain additional knowledge on what organizations have a vested interest in green collar jobs. Thus, potential partners will be identified in this section.

Forming partnerships is an essential aspect during the development of any retrofit job training program. An organization must consider public and private actors who currently play a role in both the job training sector and retrofitting sector. Upon identification, these actors should be assessed to determine what type of role they play, in addition to determining their potentiality for partnership. Pre-existing relevant partnerships must also be assessed to determine their applicability to the training program.

For the purposes of this report, partnerships will be categorized as either monetary or non-monetary. Monetary partnerships are the most significant because securing adequate funding is a crucial element to implementing a building retrofit training program. Potential funding sources must be identified and subsequently evaluated for feasibility. Federal, state and city governments, private companies, banks and foundations are examples of prospective funding sources. Non-monetary partnerships with public and private entities are also important and must be considered. Non-monetary partnerships serve numerous purposes, including the ability to supplement the curriculum and to provide job placement opportunities for trainees.

Several local training programs demonstrate the importance of both monetary and non-monetary partnerships. For example, Bronx Community College established Project H.I.R.E. and has partnered with the New York State Department of Environmental Protection, Croton Water Filtration Plant, local labor unions and other local employers.⁸¹ This program teaches construction and basic job skills and is targeted at Bronx residents looking to re-enter the workforce.⁸² The Department of Environmental Protection and Croton Facilities Monitoring Committee (FMC) fund the training program.⁸³ Upon graduation, trainees are employed at Croton FMC, or with a local union or another organization, including Columbia University and Safe Horizon.⁸⁴

Project H.I.R.E. is one example of a potential partnership. The following is an in-depth assessment of the potential monetary and non-monetary partnerships Sustainable South Bronx can form, in the process of establishing a retrofit training program.

Monetary Partnerships

Federal Funding

The federal government is a potentially significant funding source. Federal agencies currently support over 1,000 grant programs, awarding approximately \$400 billion annually.⁸⁵ Many agencies provide funding specifically for projects related to general community development, labor training, energy and the environment, which are all considered when developing a retrofit training program. The following grant programs are two of the most relevant and recent of these federal funding options for a green job training program.

1. Green Jobs Act⁸⁶

The purpose of the Green Jobs Act (Act) is to establish national and state-level job training programs, administered by the United States Department of Labor, to reduce job shortages that impair green industries. This includes energy efficient vehicle production and alternative fuel development.⁸⁷

The Act allocates \$125 million annually to create a training program for approximately 30,000 energy efficiency and renewable energy workers.^{88 89} Of that \$125 million, 20 percent is allocated specifically for a “Pathways Out of Poverty” demonstration program, in which grants will be given specifically to entities that “serve individuals in families with income of less than 200 percent of the sufficiency standard.”⁹⁰ Another \$80 million is allocated for green job re-training, and the remaining \$20 million is used to support renewable energy and energy efficiency research. These funds will be distributed by the Department of Labor in the form of grants. The entire grant program must be set up within six months of the bill’s enactment (December 2007).⁹¹

Although the specifics of the Pathways Out of Poverty program have not yet been established, it is clear from the details provided by the Act that an organization like

SSBx would be an excellent candidate for this type of grant. Eligible entities are defined as community-based nonprofit organizations, educational institutions, public and private employers and labor organizations. Priority will be given to programs that involve employers and labor organizations in development stages, deliver courses at alternative times, leverage additional public or private funding resources and demonstrate experience in administering grants. The types of activities are also enumerated and include occupational skills training, health and safety training, certifications, internships, customized training in conjunction with an apprenticeship program and “outreach activities,” such as career guidance. It is important to note, however, that all of these activities are not required, and can, if necessary, be “coordinated with existing systems or providers.”⁹²

This Act, and in particular the Pathways Out of Poverty program, can potentially provide a viable source of funding for the development of a retrofit job training program within the South Bronx. However, there appears to be a few obstacles. First, though the Act has been enacted into law and funds have been appropriated, Congress has not yet allocated these funds.⁹³ Hypothetically speaking, Congress will do so within the Fiscal Year 2009 Budget. However, until this happens, the money necessary to support the grant program is not available. In addition, before funding can be allocated, the new program must be implemented by the Department of Labor, and certain measures may need to be taken, including drafting new regulations. This could be time consuming, and although the aforementioned six-month deadline exists, it is not uncommon for federal agencies to exceed these types of deadlines. While SSBx cannot apply for these funds until this occurs, in the interim, SSBx should both gather data to verify its ability to meet grant criteria, as well as take into consideration the “priorities” and “activities” specified in the Act during the program development phase.

2. Energy Efficiency and Conservation Block Grant Program (EECBG)⁹⁴

The stated purpose of the EECBG is to assist cities, counties and states in implementing energy efficiency and conservation strategies. The program was an initiative spearheaded by the United States Conference

of Mayors beginning in January 2007. Legislation was initially introduced in May 2007 as part the Energy Act and was included in the final language passed in December 2007.⁹⁵

EECBG appropriates \$2 billion annually to help cities, counties and tribes in the United States reduce fossil fuel emissions, in addition to improving energy efficiency in the transportation sector, building sector and other energy-intensive sectors. Of this, \$1.36 billion will go toward a “Formula City & County Program,” which will provide grants to cities and counties over a threshold size.⁹⁶ These funds will be distributed by the Department of Energy, and although the formula for determining size of the grants has not yet been determined, it will be largely based on population size. Eligible activities under this program include conducting residential and commercial audits, performing energy efficiency retrofits, and “any other activity as determined by the Secretary of Energy.”⁹⁷

Unfortunately, in terms of allocation of funds, EECBG is in a similar position to the Green Jobs Act. Theoretically, Congress will authorize funding within the Fiscal Year 2009 Budget. Notably, however, the EECBG was not included in President Bush’s proposal, submitted in January 2008. Since that time, a letter has been sent to the Budget Committee on behalf of the United States Conference of Mayors, but no action has been taken.⁹⁸

In addition, the structure of EECBG also poses a problem: A not-for-profit organization like SSBx is not able to apply on its own. Although each city or county may establish its own process for allocating the sub-grants, in the case of New York, the City must jointly apply with an organization. Thus, SSBx would have to lobby the City and county to agree to petition for a grant with them. Next, as previously mentioned, there is a somewhat stringent limitation to sub-granted funding.

State and Local Agency Funding

State funding is available primarily through the New York State Energy Research and Development Authority (NYSERDA). NYSERDA offers funding in both renewable energy resources and also energy efficiency improvement. To initiate a contract with NYSERDA, project proposals must be submitted during open periods of enrollment. Project proposals should reflect the priorities in NYSERDA’s multiyear research

program plan, Leading the Way in Energy Innovation: A Three-Year Strategic Outlook- 2007-1010.⁹⁹ NYSERDA contracts are initiated in two ways: competitive solicitations and unsolicited proposals. However, it is NYSERDA's policy to use competitive solicitations above unsolicited proposals. The following are a few potential NYSERDA funding sources:

- **New York Energy \$mart Communities Program:** Creates networks of organizations and agencies that contribute to energy-focused neighborhood projects. The program provides economic, environmental and social benefits through energy efficiency and the diverse use of energy resources.
- **Enhanced Commercial/Industrial Performance Program:** Provides incentives to commercial businesses for energy efficiency upgrades in existing buildings
- **Peak Load Reduction Program:** Increases electric grid reliability and load factor by providing incentives to reduce peak demand in multi-family buildings. The program is open to eligible contractors which include individual building owners or operators, lease holders, energy service companies, or any demand response provider.
- **Multi-family Building Performance Program:** Works with developers, building owners and their representatives to improve the energy efficiency, health, safety and security of residential buildings with five or more residential units.

Private Funding

Private funding is available in the form of grants, low interest loans and investments. Sources for private funding include non-profit organizations, for profit businesses, financial institutions, and foundations. This financing may be available for an employee training program, or more frequently, a training program coupled with a small business, containing a source of revenue.

Sustainable South Bronx has already achieved funding from a host of organizations and thus is well-positioned to receive additional funding from additional sources. These organizations include private companies such as Consolidated Edison and the Sundance Channel, foundations such as American Cities Foundation, universities such as University of California at Berkeley

and Princeton University, and the Office of the Governor of Pennsylvania.¹⁰⁰ Sustainable South Bronx should continue to reach out to private organizations to secure funding. An effort should be made to establish new relationships with private foundations that can serve as a resource in the form of grants. One such example is the Public Welfare Foundation, which awards grants ranging from \$25,000 to \$50,000 to non-profit organizations for a wide range of purposes, including education and training. These grants are specifically targeted at organizations that operate in low income and otherwise disadvantaged communities, and whose activities encourage service, advocacy and empowerment, and thus are appropriate for SSBx.¹⁰¹

Non-Monetary Partnerships

In addition to funding, a retrofit job training program must also establish non-monetary partnerships. These partnerships are useful for understanding industry best practices including green building standards and resource suppliers, developing a network of potential employers for trainees, advisory services and expansion opportunities. Potential non-monetary partners may be governmental, private, or public. The following sections list examples of entities that Sustainable South Bronx can consider forming a non-monetary partnership with.

State and Local Agencies

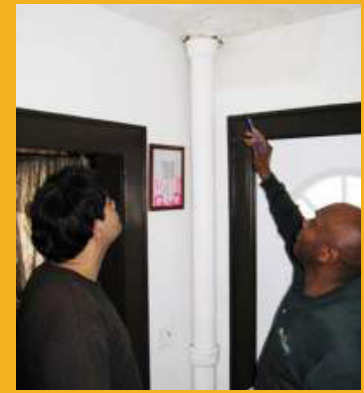
In addition to funding, NYSERDA has great potential to serve as a partner in a non-monetary capacity. Occasionally, NYSERDA offers job training programs. However, these programs are usually training workshops in renewable energy resources such as how to install solar photovoltaic paneling. There are residential programs, too, that help homeowners and renters reduce their energy costs. Also, programs exist that train contractors on how to provide quality energy efficiency services to the public. Furthermore, NYSERDA is partnered with different contractors, builders, multifamily partners, retailers and manufacturers. This statewide network of partners works together to offer energy efficiency solutions and educate the public on how to reduce energy usage and costs.



Community Environmental Center

The Community Environmental Center (CEC), founded in 1994, is a BPI-accredited contractor, serving building and home owners throughout metropolitan New York. They provide a full range of services, including auditing and installation of retrofit technologies. Initially established to work with low income households, CEC has since branched out to commercial, industrial, medical, and educational facilities. CEC maintains a staff of over 70 employees, many of whom are BPI-certified in various areas. They have partnered with NYSEERDA as a Home Performance Contractor and hold the largest state-issued home weatherization contract. Each year, they provide over 1,000 clients with state-assisted home improvement services. CEC also has two affiliated organizations, Solar One and Build It Green! NYC.

Source: <http://www.cecenter.org/about/>



If SSBx were to develop a small retrofit business in conjunction with a job training program, SSBx could become a participating NYSEERDA Home Performance Contractor (for single family homes) or a Multifamily Performance Partner (for multifamily buildings). Participation in both programs requires an extensive application process. A Home Performance Contractor must have at least one staff member who is BPI certified at the Specialist level, and the organization itself must also be BPI accredited. NYSEERDA reimburses a portion of the costs associated with certification/accreditation, as well as provides optional training prior to the tests. An organization must then submit a Participation Agreement, including a Market Region Signature Form which indicates where they will provide their services.¹⁰² In order to become an approved Multifamily Performance Partner, an organization must first complete a Partnership Agreement. Requirements for this agreement include documentation demonstrating “capability to conduct business,” as well as “thorough knowledge of energy efficiency and the comprehensive opportunities available to multifamily projects.”¹⁰³ In particular, an organization must provide evidence that at least one individual “has acted in a lead capacity on at least three multifamily projects for which comprehensive energy efficiency scopes of work were developed and fully implemented.”¹⁰⁴ After an agreement is submitted by an organization, it is

reviewed by NYSEERDA’s technical evaluation panel. Upon approval, that organization must then attend an orientation before becoming a qualified Partner of the program.¹⁰⁵ Participation in either of these programs means that SSBx would receive both free promotion on NYSEERDA’s website as well as new business contacts in the form of referrals. NYSEERDA also provides financial incentives to its partners, by making funds available for marketing and equipment.¹⁰⁶

Another agency to consider working with is the New York City Housing Authority (NYCHA), which has embarked on “Green Initiatives” as part of the PlaNYC strategy to reduce greenhouse gas emissions. As a public housing authority, NYCHA receives many options for financing and implementing energy efficiency measures, one of which is an Energy Performance Contract, where energy efficiency measures are financed, installed and maintained by an energy service company (ESCO). The enactment of the Energy Policy Act of 2005 encourages NYCHA to invest in home energy performance measures such as window replacement, heating system replacement and wall insulation. A subtitle of the Act extends the term of a contract to a maximum of twenty years to pay back the money borrowed for energy conservation measures.¹⁰⁷

NYCHA is currently involved in several partnerships. For example, NYCHA has a partnership with the New

York Power Authority (NYPA) which has replaced conventional hot water tanks with energy-saving instantaneous hot water heaters. The Hot Water Storage Tank Replacement Program cost \$64 million and has improved 55 housing developments throughout the City.¹⁰⁸

Clinton Climate Initiative

In May 2007, the Clinton Climate Initiative (CCI) launched the Energy Efficiency Building Retrofit Program (EEBRP) in an effort to bring together energy service companies (ESCOs), financial institutions, and cities to reduce energy consumption in existing buildings. To date, CCI has developed projects which partner many of the world's largest cities and private building owners with four of the world's largest ESCOs to perform energy audits and retrofits of public and private facilities.¹⁰⁹ These projects are funded by five of the world's largest banks which have each committed \$1 billion in loans.¹¹⁰ These loans plus interest will eventually be paid back by the cities and building owners with the energy savings generated by reduced energy costs.¹¹¹

Since launching EEBRP in May, several projects have been announced and many are currently underway. Some examples of these projects are:

- New York City Housing Authority (NYCHA): In December 2007, it was announced that a "sustainability partnership" had been established between NYCHA, the City of New York, CCI, and the Department of Housing and Urban Development (HUD). Through this partnership, NYCHA is currently performing audits and retrofitting its buildings city-wide with the technical and financial support of CCI and HUD.¹¹²
- Privately owned buildings
 - Sears Tower and Merchandise Mart in Chicago¹¹³
 - General Electric Real Estate: CCI and GE Real Estate (a business unit of GE Commercial Finance) are working together to identify and implement building retrofit projects across the company's global portfolio. GE Real Estate owns more than \$72 billion and 385 million square feet of commercial real estate worldwide. Initial efforts will start in

CCI partner cities, where the company owns significant property.¹¹⁴

- Housing: CCI and the City of Chicago are developing a program for the retrofit of privately-owned, multi-tenant housing. In coordination with the Department of Housing, building owners will "jointly contract for energy performance contracts and use future energy savings to finance the project implementation."¹¹⁵
- Green Schools Program: Aside from cities and private building owners, CCI has also partnered with the United States Green Building Council (USGBC) to help K-12 schools across the country reduce energy consumption in school buildings. CCI is also working with the American College and University Presidents Climate Commitment (ACUPCC) to retrofit colleges and universities nationwide.¹¹⁶

Sustainable South Bronx could attempt to build a relationship with CCI which would guarantee job placement or contracting jobs for its various retrofit projects throughout the City. This could be accomplished in the form of a baseline percentage agreement, or for a specific initiative. However, many CCI projects are still in the development phase, and depending upon what types of technologies are included, SSBx trainees may not be qualified. The potential remains, however, because CCI is fully committed to the concept of using building retrofitting to create jobs.

Trade Unions

An organization considering entering the retrofit market must evaluate the role that trade unions play in the construction industry. The construction industry is comprised of three general categories: residential, commercial and infrastructure construction.¹¹⁷ The construction industry is cyclical and is driven by the status of the economy. At the operational level, this cyclical pattern is retained because many jobs are project-based. Workers and companies have dealt with the unpredictable nature of construction jobs by producing a strong organized labor force that encapsulates many of the trades involved in every stage of construction.¹¹⁸ Thus, an organization hoping to enter the construction market through retrofit job training must take this into account. The kind of role these unions play locally must also be determined.

The unionized construction workforce is generally defined by two characteristics:

- Workers entering the unionized construction trades participate in a three to five year apprenticeship involving on-the-job training and a specified number of hours of classroom instruction.
- Unionized workers have strong collective bargaining leverage, which have resulted in standard wages and benefits. Construction trades earn some of the highest wages in New York City for workers that have completed no education beyond high school.¹¹⁹

In New York City, the proper enforcement of the wage law in non-union construction sites has not been successful. As a result, many local governments in New York State have begun to require that companies seeking public works contracts have New York State certified apprenticeship programs.¹²⁰

It is generally the larger unionized contractors that bid on public projects (\$20 million or higher), while smaller construction jobs (residential construction, renovation and landscaping) generally consist of non-unionized workers.¹²¹ Small construction jobs are commonly non-unionized and largely unregulated. Thus, this sector of the industry offers the lowest wages and benefits.¹²²

Some form of a partnership should be considered with New York unions. Opportunities exist for SSBx to work with these labor organizations, whether through a pre-

apprenticeship program or a formal agreement, such as a Memorandum of Understanding or bid provision. However, unions are extremely protective of their members. Unions have achieved several types of hiring agreements that ensure a constant demand for work. In New York, for example, union contractors have the advantage over non-union contractors to bid on public works projects. Currently, the building retrofit market has not given many labor unions the confidence to increase membership.¹²³ It can be expected that membership will remain constant until there is a significant increase in this type of work. By building partnerships with groups that have access to unions, such as Apollo Alliance and Project H.I.R.E., Sustainable South Bronx might improve its chance for entering more workers into unions in the future.

The New York City Central Labor Council (NYCCLC), for example, is a non-profit labor membership organization that supports and advocates for the working people of New York City. The NYCCLC consists of 400 local unions from the public and private sector.¹²⁴ New York City Central Labor Council and Urban Agenda have created the Jobs Working Group as part of Mayor Bloomberg's Sustainability Advisory Board.¹²⁵ The Sustainability Advisory Board focuses on implementation of the PlaNYC 2030 recommendations for a "greener and greater New York City."¹²⁶ The Jobs Working Group recommends strategies and policies to ensure that PlaNYC 2030 creates quality jobs.¹²⁷



D.C. Greenworks

D.C. Greenworks is a nonprofit social enterprise that serves the Washington, D.C. community and provides green roof consulting, design and installation services, in addition to low impact development (LID) services. D.C. Greenworks works with community leaders, inner-city residents, neighborhood organizations and small businesses to leverage grassroots participation, in an effort to improve both the environment and the quality of life of Washington, D.C.'s residents. The Green Collar Job training program through D.C. Greenworks contains a number of apprenticeships that focus on the need for a green D.C. community, in addition to education, job training and employment opportunities for local residents. D.C. Greenworks has established itself as the "go-to" organization for green roof installation in the greater Washington, D.C. area and continues to lead in the green roof industry. For more information, refer to Appendix I.



Summary

An organization like Sustainable South Bronx needs to establish partnerships in order to succeed at creating a retrofit job training program. Most importantly, it will have to do so in a monetary capacity in order to secure funding. In addition, it will be necessary to align SSBx with government agencies, not-for-profit organizations and businesses in non-monetary capacities. This is necessary to supplement SSBx's resources for the development of the curriculum and the execution of the training and job placement.

Opportunities and Obstacles: Introduction to the Recommended Program

The emerging building retrofit industry has the potential to significantly address global climate change and also create millions of green collar jobs. As market forces and regulatory pressure work together at the federal, state, and local level, this industry's future looks promising. This is especially true in New York, where both the environmental and economic costs of unchecked energy and water use from buildings are particularly high. As efficiency and conservation have become a greater priority of governmental officials and average citizens alike, financial incentives and new regulations have surfaced. Tax credits, subsidies, Local Law 86 and revisions to current building codes are all efforts on the part of state and municipal governments to encourage residential and commercial building retrofits. These retrofits, through auditing, installation of new technologies and maintenance, will substantially improve the City's economic and environmental fitness. Furthermore, as the demand for retrofit services increases, the need for a greater labor supply will become apparent, ultimately leading to job creation. SSBx and the citizens of The Bronx can take advantage of this emerging industry by developing a retrofit training program, which will simultaneously create jobs and green the community. In order to successfully implement such a program, SSBx must first form partnerships to secure funding as well as supplement training and job placement resources. Funding sources can be tapped at the federal, state and private level, through initiatives such as the Green Jobs Act,

NYSERDA-sponsored programs, and New York Public Welfare Foundation grants. Non-monetary partnerships may be pursued with other training and job placement programs, state and local agencies, businesses, and groups coordinating larger retrofit projects.

However, despite the many opportunities that are currently present for a retrofit job training program, success will be predicated upon overcoming several obstacles.

First, the future of the market, while generally promising, is still somewhat unknown. The construction industry has always been subject to boom and bust cycles and the current economic uncertainty increased the potential for a downswing that cannot be ignored. Fortunately, the negative effect of market forces can be curbed by growing regulatory pressure. However, a lack of a comprehensive approach may be a problem. Currently, regulation on the whole is moving in a positive direction. Nevertheless, a lack of uniform building codes, standards for green buildings and accreditations still plague the industry.

Second, as technologies continue to emerge, it is difficult to determine exactly when it is most appropriate to complete the jobs. This constantly changing technological environment presents serious problems for those who wish to participate as a consumer or as a provider. Moreover, uncertainty exists regarding some of the available funding options. At the federal level, funding opportunities are still in their infancy, and at the state level, opportunities are mired in a somewhat inefficient system of distribution.

Finally, though the potential for partnerships is great, there are some actors who may be problematic to work with. Unions, for example, may not be receptive to such a training program, particularly if the economy declines and the job market becomes more competitive.

It is clear that the opportunities for retrofit job training are great, but in order to ensure overall success, SSBx must tailor its program to overcome potential barriers. The next section will propose recommendations for a program design which maximizes job creation and environmental stewardship while addressing these concerns.

CHAPTER 4

Recommended Program



Green Retrofit Education And Training

Given the momentum in the market for green building retrofits that has been demonstrated by this report, a retrofit training program is a novel idea. In the spirit of the SSBx B.E.S.T. Program, the proposed retrofit training program will be referred to as the Green Retrofit Education And Training (G.R.E.A.T.) Program.

The objective of the G.R.E.A.T. Program is to give opportunity to people in areas of little opportunity. In designing this training program, attention was given to providing trainees with general life skills and specific retrofit skills, in addition to placement in existing positions and placement in newly-formed positions.

Recommended Curriculum

This retrofit training program includes the best practices of similar trainings in The Bronx and across the country. The recommended curriculum has four components:

Life Skills Training

Life skills that are incorporated into a job training program will help students succeed in the workplace. As part of life skills training, students are empowered with each challenge that is presented to them.

A key component of the B.E.S.T. Program at SSBx is life skills. This highly successful program demonstrates that a curriculum with job training combined with life skills is very effective. B.E.S.T. has a job placement rate of 89 percent, and 10 percent of the students continue on to higher education.¹²⁸ Furthermore, the retention rate is 98 percent and nearly all students graduate from the program. The program originated five years ago with four students, and currently has 18 students enrolled. It is expected to grow to 20 students in the next training session. The B.E.S.T. program is ten weeks long and occurs three times during the year.

The cost of B.E.S.T. is approximately \$7,000 per student, and the G.R.E.A.T. training should conform to this price range, depending on the number of upper-tier technologies included. For B.E.S.T., the cost includes an unlimited MetroCard for the student to commute to training, \$5 per student food allowance per day, a Carhartt brand work uniform for each student (work pants, sweatshirt, SSBx t-shirt, cap, Timberland boots and rain gear), lectures given by Lehman College

1. Life Skills Training

Eight to ten hours of training interspersed throughout Technical Retrofit Training. As part of the job training curriculum, the trainee must learn the importance of team work and time management. The life skills component ensures that the trainee will know how to succeed in the workplace on an interpersonal level.

2. Technical Retrofit Training

This portion of the curriculum will depend on the total number of technologies taught. Students will learn the mechanics of the different technologies that can be used to improve water and energy efficiency in a building. Technologies are divided into three tiers, from changing light bulbs to installing solar-water heaters.

3. Supporting Skills Training

This part of the training includes suggestions from similar training programs and modules on competencies that are most likely very important in the emerging green collar industry.

4. Practicum

The duration and depth of this section depends on the number of technologies being taught. As part of the retrofit curriculum, the trainees will take their developing technical skills and apply them to local buildings. This portion of the curriculum has a dual purpose to first, reinforce learned skills through hands-on activity and second, to contribute to the greening of the local Bronx community.

professors, a 40 hour Hazmat training conducted by an outside contractor, office supplies and staff salaries at SSBx. Currently, one SSBx staff member organizes and conducts the ten week training program.

Following a training structure similar to B.E.S.T., it is recommended that life skills consist of four parts: team building, financial management, time management and issues in the workplace.

Team Building

This component is critical to helping students work cooperatively with others in the workplace. The majority of the allotted time for life skills training should to be spent developing team building skills. The staff member who conducts the team building should be an integral part by maintaining contact with the students throughout the training period.

Financial Management

This component teaches students to manage their money by learning how to fill out a budget worksheet. Recently, B.E.S.T. has partnered with HSBC to discuss banking and budgeting.

Time Management

Exercises are conducted to help students prioritize their schedules. The student is taught the importance

of punctuality and honoring appointments. In addition, students learn to set short-term (six months to one year) and long-term (five years) goals during the training.

Issues in the Workplace

Attention is given to sexual harassment in the workplace, and a copy of the New York State Workplace policy is distributed to each student to emphasize the importance of adhering to laws in the workplace.

Integrating drug screening into the training curriculum will highlight the importance employers place on having a drug-free workforce. The RichmondBUILD program, for example, uses drug screening to illustrate to potential employers that graduating trainees are drug-free. This has increased the confidence potential employers have in hiring RichmondBUILD graduates.¹²⁹

Supporting Skills Training

Successful training programs have included important topics in the classroom to give students a deeper appreciation for what they are working to accomplish. For G.R.E.A.T., the following topics are relevant:

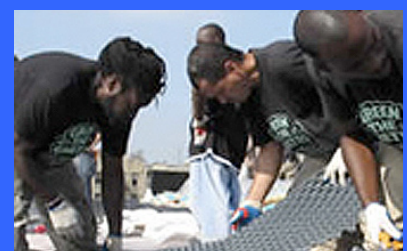
- Overview of current global environmental issues and the importance of building retrofits: This is similar to what is included in the Oakland Green Job Corps program (see Oakland Case Study, Appendix IV).



Sustainable South Bronx's B.E.S.T. Program

The Bronx Environmental Stewardship Training Program, or B.E.S.T. Program, began in 2003 at Sustainable South Bronx and teaches qualifying students techniques such as green roof installation, hazardous waste clean-up and tree pruning, during an intensive ten week hands-on program. Because the B.E.S.T. Program is free to qualified applicants, local South Bronx residents gain the opportunity to manage their local environment, while simultaneously learning marketable skills and finding high quality, living wage jobs through the resources available at Sustainable South Bronx. Outside donors have contributed to the expansion of this endeavor, including Mitsubishi International Corporation.

Source: <http://www.ssbx.org/best.html>





Oakland Green Jobs Corps

The Oakland Apollo Alliance is a coalition of environmentalists, community organizations and labor unions working together to create quality jobs in the current economy, while simultaneously aiding underserved residents and bettering the environment. The Oakland Apollo Alliance is a “movement building” project, where groups from different backgrounds are able to work together. The Oakland Green Jobs Corps (Corps), launched in early 2008, is a project of the Oakland Apollo Alliance (OAA) and the curriculum within the Corps is divided into five distinct sections: Recruitment and Outreach, Three-Month Training period, Six-Month Paid Internship period, Graduation and Career Options. The primary goal of the Corps is to provide viable job opportunities for young adults, while promoting environmental stewardship.

Sources: <http://www.ellabakercenter.org/page.php?pageid=31> and http://www.ellabakercenter.org/downloads/rtf/oakland_green_jobs_corps_summary.pdf



- “Labor Unions 101” also modeled after the Oakland Green Job Corps program (see Oakland Case Study, Appendix IV).
- Familiarity with NYSEDA incentives to help finance energy saving retrofits. Appendix XI contains a list of current offerings.
- Entrepreneurial skills and spirit: Given that the green collar industry is in its infancy, trainees may have the opportunity for self employment and should be introduced to the concept in the training program.
- Instruction on how to read building blue prints (this was suggested by many of the employers who would like to participate in the program).
- Asbestos removal and safety procedures (this was suggested by many of the employers who would like to participate in the program).

Technical Retrofit Training

Technical training is based on the Building Retrofit Technology Tiers discussed in Chapter 2. The tiers correspond to ease of implementation and cost to customer, as previously noted.

Tier One – “Ground Floor” – Free, Low Cost, or Self-Installation

Tier One technologies can be implemented easily as a first step in the building retrofit process. Tier One is a checklist of technologies and practices that are typically inexpensive and can be implemented by the homeowner. This technology tier does not require specialized training in the curriculum. Tier One technologies include:

1. Installation and use of Energy Star appliances and electronics;
2. Installation of compact fluorescent light bulbs;
3. Changing thermostat settings and light fixtures; and
4. Installation and use of flow reduction aerators and low-flow showerheads.

Tier One can be taught internally by Sustainable South Bronx. In addition, these energy and water management techniques do not require specialized training.

Tier Two – “Mid-Level” – May Require Professional Building Audit and Professional Installation

Tier Two technologies typically require professional installation and may require a professional building audit. Some Tier Two technologies will require a building audit to assess the efficiency of a building prior to retrofit. Tier Two technologies include:

1. Sealing building exterior;
2. Window replacement and insulation;
3. Demand or tankless water heater installation;
4. HVAC efficiency and commissioning;
5. Programmable thermostat installation;
6. Lighting occupancy sensors installation;
7. Smart meter installation;
8. High-efficiency plumbing fixture installation;
9. Storm water mitigation; and
10. Reduced landscaping water use.

Two courses are offered locally to augment Tier Two training:

Electrical and Plumbing

Electrical and plumbing-related training can be obtained from Bronx Community College (BCC). BCC offers courses in shop safety (a prerequisite), electricity and plumbing for about \$400 per course. These are 50-hour courses typically taught once a week for two to three hours.

Building Auditing

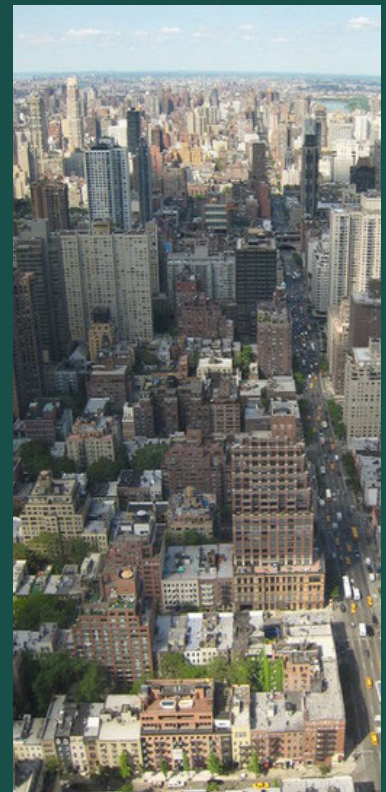
A necessary step for many Tier Two technologies is a professional building audit. This audit assesses the performance of the building and can identify areas needed for efficiency improvement. The Association for Energy Affordability, which has a training center in the Bronx, offers Building Performance Institute Accredited courses trainees to become Building Analysts and Envelope Specialists (Refer to Case Study below). The Building Analyst course involves 36 hours of training, typically over the course of a few weeks, in topics such as building tightness, air leakage and the use of building diagnostic equipment for assessing building efficiency.



Association for Energy Affordability

The Association for Energy Affordability (AEA) is a non-profit training and technical services organization serving the metropolitan New York area. As a technical provider, AEA performs energy audits and retrofit technology installation for low- and moderate-income families. A BPI-accredited contractor, AEA has partnered with NYSERDA as both a Home Performance and Multifamily Performance Contractor. In addition to technical services, AEA's Energy Management Training Center, located in the South Bronx, is an educational resource for building management and energy professionals. AEA offers technical training in a variety of fields related to energy management including, but not limited to, weatherization, boiler repair and auditing. As an affiliate of BPI, they provide training courses for, as well as proctor, certification exams. They are also recognized as a Training/Learning Center by both the New York State Weatherization Program (WAP) and NYSERDA's Workforce Development Institute of Hudson Valley Community College.

Source: http://www.aeanyc.org/site/c.dhJJTOzFoH/b.1676919/k.C96A/About_Us.htm



The course fee is \$1,245 per student and there is a \$200 examination fee to achieve certification once the course has been completed. Certified Building Analysts can then seek certification as an Envelope Professional which trains on the following topics: visual inspection, advanced blower door applications, duct diagnostics, air sealing, insulation techniques, window and door inspections and ventilation. The Envelope Professional course involves 30 hours of training for \$1,325 per student plus a \$200 examination fee.

Tier Three – “High-Rise” – Expensive Or More Difficult to Implement

Tier Three technologies may be more expensive or more difficult to implement in an existing building. These technologies include:

1. Solar photovoltaics;
2. Solar water heaters; and
3. Green roofs

One course is offered locally to augment Tier Three training:

Photovoltaics

The Center for Sustainable Energy at Bronx Community College offers photovoltaic installation training based on NABCEP certifications. This course involves 40 hours of training over 8 weeks for \$570 per student, with classes meeting for five hours once a week.

Green Roofs

Please see Appendix V for additional information on Sustainable South Bronx’s B.E.S.T Program.

Practicum

Using the above learned skills in a real life scenario poses an exciting opportunity for the trainees and for The Bronx. SSBx can enlist volunteer buildings or apartment units to receive free retrofits from trainees. In this portion of the training program, small groups will retrofit units, under supervision. Trainees have the opportunity to practice their newly-acquired skills by spending a few days and up to a week completing the work. Alternatively, the practicum can be used as a follow-up after each technology training session, which gives the trainees the opportunity to practice each specific new skill. This hands-on experience will

reinforce the learned skills, in addition to beginning to retrofit residential buildings in the South Bronx. In sum, the practicum will subsidize the retrofits of residential buildings in the South Bronx as part of the hands-on training.

The G.R.E.A.T. Program: A Successful Marriage of Important Skills

The G.R.E.A.T. Program’s combination of life skills training, technical retrofit training, supporting skills training and a hands-on practicum is a comprehensive approach to retrofit training and is based upon industry best practices. The following chapter describes job placement strategies to ensure that all G.R.E.A.T. Program graduates are given the chance to use their newfound skills in a workplace setting.



CHAPTER 5

Job Placement Strategies

The success of a job training program hinges on the ability of the graduates to find paid positions to utilize their newfound skills. There are four alternative job placement strategies that SSBx may pursue to connect graduates with employers:

- A. Direct Placement;
- B. Establish a Small Business;
- C. Develop Union Programs; and
- D. Launch an Energy Service Company.

Direct Placement

The most straightforward job placement strategy is for SSBx to use existing resources and relationships established by the B.E.S.T. Program to immediately place graduates in appropriate jobs.

To implement this strategy, SSBx needs to devote resources to creating new relationships and expanding the organization's current network. Again, existing B.E.S.T resources can be used. However, as the retrofit program grows, additional job placement resources will be needed. This network will grow over time, along with the number of program graduates and the number

of successful placements. The limiting factor of this approach is scale: The number of graduates and alumni requiring job placement services may overwhelm the staff.

One way to overcome this issue is to work with other organizations running similar placement programs, or to partner with organizations that may offer connections to employers, such as the Clinton Climate Initiative. There are several organizations that manage job placement programs for individuals who are in similar positions as those targeted by Sustainable South Bronx. See Figure 10 for additional information and examples of job placement organizations. Comprehensive descriptions of Job Placement Organizations are available in Appendix VI.

To begin the networking process for SSBx, six businesses have been identified that have expressed a willingness to discuss future job placements for successful graduates (see Figure 11). These businesses have been briefed on what SSBx is attempting to accomplish with G.R.E.A.T. and feel that in the future, they may have the opportunity to work with successful graduates in the future. Each organization gave permission to be included in this report. In this approach, SSBx can take advantage of the specific funding opportunities outlined in Figure 12.

Figure 10: Job Placement Organizations

Program Name	Contact Information
Worker Career Center	(718) 960-7099 or www.nyc.gov/workforce1
SoBro	(718) 292-3113 555 Bergen Ave. Bronx, NY 10455
NYIRN	Jayant Kairam at jkairam@nyirn.org or www.nyirn.org
The Heart of Brooklyn	www.heartofbrooklyn.org or Mollita Abron Muhammad at mmuhammad@heartofbrooklyn.org

Establish A Small Business

Alternatively, SSBx can decide to establish a small business to employ graduates. In essence, a small business is a vehicle used to stimulate local green building and retrofit demand in the South Bronx. The training program itself has the capacity to spark interest in the community because of the hands-on curriculum, the recruitment process and the overall publicity for the training program.

A small business that is closely related to and aligned with SSBx can employ graduates in the auditing and retrofitting sector. This option gives SSBx control over the demand and market for retrofit jobs. The small business will need to

Figure 11: Companies Interested in Discussing Job Placement with SSBx

	Business Name	Description	Contact	Comments
1	Green Power Solutions	Provide alternative energy solutions and assistance with financing and incentives.	Thomas Gatley	
2	Argaman Management, Ltd.	Construction and renovations, headquartered in Bronx.	Igal Shetrit, Owner 914 424-5163; igalarc@hotmail.com	Newly formed in March 2008
3	Bronx Base Builders, Ltd.	General Construction	William Padilla 718-239-5600 willie@bronxbasebuilders.com	MBE. Member of Small Business Solutions
4	Core Environmental, Inc	Phase I and II environmental assessments	Teresa Tramosch 718-762-0544 tst@coreenv.com	WBE; specializes in lead and asbestos inspectors; Member of Small Business Solutions
5	Innovative Building Solutions, LLC	General construction/construction management	Juana Gauthier 718-676-1065 juana@innovativebldg solutions.com	MBE; breaking into green construction; interested in helping to train; Member of Small Business Solutions
6	Ideal Construction	General construction/construction management	Frank Degrande 212-262-7005 fdegrande@ideal-interiors.com	MBE; Member of Small Business Solutions

market techniques to educate and create demand for building retrofits. If market demand slows, the training program will be able to react by shifting training speed or adjusting enrollment numbers to appropriately react to market conditions.

SSBx has valuable experience with this model through SmartRoofs LLC. In fact, a retrofit small business has obvious synergies with SmartRoofs LLC. SSBx can utilize the existing corporate infrastructure of SmartRoofs and bypass the time and expenditures needed to incorporate a new business by merging SmartRoofs LLC and a retrofit small business into one overarching business. For example, SmartRoofs could be renamed

SmartBuildings, to accommodate this expansion.

It is important to point out, however, that while SmartRoofs has accomplished its goals for the first two years, it does not yet have enough revenue to provide steady employment. SmartRoofs has provided seasonal employment for some individuals, but the overall employment rate is not yet widespread.

Recommendations to strengthen the SmartRoofs business, either in preparation of working with retrofit graduates or to improve business performance on its own, are integral to the cost analysis of this option. Compared to the Direct Placement option, this approach

Figure 12: Option A: Direct Placement

Agency	Time Frame	Feasibility	Amount	Type	Use
<i>Federal</i>					
United States Dept. of Labor: Green Jobs Act	1 year	Medium-High	TBD	Grant	Training and job placement
United States Dept. of Energy: Energy Efficiency and Conservation Block Grant Program	1-2 years	Medium	TBD	Sub-grant	Training and job placement
<i>Private</i>					
Public Welfare Foundation	6 months-1 year	Medium-High	\$25,000-50,000	Grant	Training and job placement
Other foundations	1 year	Medium-High	\$25,000-50,000	Grant	Training and job placement

requires greater financial resources. Costs are allocated into three divisions:

1. Sales Process;
2. Project Management; and
3. Human Resources.

Sales Process, Project Management and Human Resources

The business needs to rapidly generate customers through advertising, solicitation and management of the sales pipeline. Figure 13 reviews some of the specific costs associated with generating a sales pipeline.

A final recommendation is to develop recurring revenue contracts. Tier One and Tier Three technologies are conducive to recurring revenue contracts through

maintenance and commissioning. Furthermore, Tier One requires periodic updates in multi-unit facilities when tenants change locations.

In this approach, SSBx can take advantage of the specific funding opportunities outlined in Figure 14. In addition, a small business can potentially qualify for NYSERDA's Home Performance or Multifamily Performance programs previously discussed. Again, if a small business qualifies to become a partner in one of these programs, NYSERDA will provide them with financial incentives for marketing, equipment, as well as business contacts.

Figure 13: Specific Costs of the Small Business Option

Category	Cost Object	Estimated Human Resource Requirement*	Source of External Costs
Advertising	Marketing Collateral	25 percent	Outside Agency
	Campaign Plan and Management	25 percent	None, if completed internally or based on agency
	Media Buys	0	Depends on media choices, timing and volume
Sales Pipeline Management	Sales Resources	100 percent	Printing and postage
	Website Update	50 percent	Depends if updates are completed by internal or external resource
	Contracting	20 percent	Legal fees
Project Management	Project Management	100 percent, depending on size of project, location, scope, and team size	Will quickly grow with an increase in customers, and may need to be differentiated from Client management

*Full-time equivalent in one year

Develop Union Programs

SSBx has two alternatives for working directly with unions: First, G.R.E.A.T. can function as a pre-apprenticeship training program. Second, if a small business is formed, G.R.E.A.T. can become an apprenticeship sponsor, where journeymen will train workers to become apprentices.

Pre-Apprenticeship Training Program

Designing the building retrofit training program around becoming a pre-apprenticeship training program for trade unions is a low-priced option. Apprenticeship programs require three to five years of classroom and on-the-job training. For these programs, trainee requirements include fundamental construction skills. Learning these basic skills before applying to the programs will increase the chance of trainees being accepted into trade unions.

If SSBx were to implement a program similar to RichmondBUILD, the majority of the costs would come from the hiring of an instructor who is knowledgeable in construction skills. The cost of the instructor depends on the duration of his or her employment. An annual salary is estimated to be between \$30,000 and \$70,000, which is the average salary for an experienced building trade worker in New York City.¹³² Conversely, the instructor could potentially be employed at SSBx on a temporary basis during the tenure of the program. This employment decision depends on the number of training semesters SSBx decides to offer. For example, if SSBx offers four or five training semesters per year, the instructor must be paid an annual salary.

Creating a partnership with existing pre-apprenticeship training programs in New York City is a viable option for SSBx. A training partnership will expand the training capacity of SSBx and reduce the costs of instruction

Figure 14: Option B Details: Small Business

Agency	Time Frame	Feasibility	Amount	Type	Use
<i>Federal</i>					
United States Dept. of Labor: Green Jobs Act	1 year	Medium-High	TBD	Grant	Training
United States Dept. of Energy: Energy Efficiency and Conservation Block Grant Program	1-2 years	Medium	TBD	Sub-grant	Training and job placement
<i>State</i>					
NYSERDA: Multifamily Building Performance Program	Several months, orientation required	Businesses only	TBD	Grant	Job placement
NYSERDA: Small Commercial Lighting Program Incentives	1-2 months	Businesses only	Up to \$190,000	Grant	Job placement
NYSERDA: Energy Smart Focus Program	1-2 months	Businesses in partnership with colleges, universities, healthcare facilities or local government	1000000; Five-year maximum	Grant	Job placement
NYSERDA: Enhanced Commercial/Industrial Performance Program	1-2 months	Commercial customers of Con Edison	Up to \$34,200,000	Grant	Job placement
<i>Private</i>					
Public Welfare Foundation	6 months-1 year	Medium-High	\$25,000-50,000	Grant	Training
Other foundations	1 year	Medium-High	\$25,000-50,000	Grant	Training and job placement
Con Edison	Current-1 year	Medium (SSBx already given significant grant)	TBD	Grant	Job placement
Bank of America: Neighborhood Excellence Initiative; Neighborhood Builders	1 year	Medium-High	\$100,000/year for 2 years	Grant and leadership training	Job placement

by utilizing the existing resources at the partnering facility.

Initially, SSBx can pursue a partnership with The Consortium for Worker's Education's (CWE) Worker Service Center Program. This program offers New York City residents free courses in adult basic education, computer literacy, English as a Second Language (ESL) classes and other programs in neighborhood-based locations throughout the five boroughs.¹³³ Notably, pre-apprenticeship programs are more conducive to partnerships than union programs, due to potential union politics.

Appendix XII contains information on post-training apprenticeship opportunities for graduates.

Figure 15: Option C: Unions

Agency	Time Frame	Feasibility	Amount	Type	Use
<i>Federal</i>					
United States Dept. of Labor: Green Jobs Act	1 year	Medium-High	TBD	Grant	Training and job placement
United States Dept. of Energy: Energy Efficiency and Conservation Block Grant Program	1-2 years	Medium	TBD	Sub-grant	Training and job placement
<i>Private</i>					
Public Welfare Foundation	6 months-1 year	Medium-High	\$25,000-50,000	Grant	Training and job placement
Other foundations	1 year	Medium-High	\$25,000-50,000	Grant	Training and job placement

Becoming An Apprenticeship Sponsor

Apprenticeship programs combine on-the-job training with classroom instruction. Several trade unions have a long tradition of operating well-designed apprenticeship programs specific to their trade. Workers who are beginning these programs have the opportunity to learn all the skills of their trade under the direction of experienced journey workers, while they are employed.¹³⁴

Employers can register with appropriate state or federal agencies as an official apprenticeship program.¹³⁵ To become an apprenticeship sponsor, SSBx must first become a registered employer in New York City. This recommendation is contingent upon the creation of a building retrofit business or another business owned by SSBx.

There is a moratorium on new apprentice programs in New York City. Once the moratorium is lifted, new programs are able to be implemented. The paperwork required to be completed to initiate an apprenticeship program takes approximately three months, and acceptance is contingent upon small business status.

Designing an apprenticeship program is a high-cost option. SSBx is required to provide apprentice salaries during the training, in addition to all costs associated

with classroom instruction and on-the-job training.

The amount of classroom instruction varies by trade, but averages about 140 hours. Courses are provided by local community colleges and training institutes. Depending on the trade, the cost for 140 hours of building trade instruction at Bronx Community College ranges from \$1,500 to \$1,200.

The New York Department of Labor requires apprenticeship sponsors to employ two to three journey-level workers per apprenticeship. The average salary for journey-level workers also varies by trade. In New York City, annual salaries range from \$30,000 to \$70,000 for experienced workers and \$18,000 to \$37,000 for entry-level workers.¹³⁶

The specific requirements for becoming an apprenticeship sponsor are determined by calling an Apprenticeship Training Representative (ATR). These representatives determine if a business meets the requirements to become an apprenticeship sponsor. The ATR also assists apprenticeship sponsors in developing their curriculum and training. The ATR for New York City is Caroline Robinson, and she can be reached at (212) 775-3304.

Upon completion of apprentice programs, apprentices are offered certifications that are required to work on specific upper-level jobs. In addition, workers have a greater possibility of achieving upward mobility. In this approach, SSBx can take advantage of the specific funding opportunities outlined in the Direct Placement section. Figure 15 depicts this option.

Launch An Energy Service Company

According to the National Association of Energy Service Companies (NAESCO), an Energy Service Company, or ESCO, “is a business that develops, installs and arranges financing for projects designed to improve the energy efficiency and maintenance costs for facilities over a seven to twenty year time period.”¹³⁷

If market demand for retrofit services reaches its full potential, SSBx has the opportunity to go beyond servicing retrofits, and can create a business to finance and perform the retrofit services. This option is a long-term decision that SSBx can make after establishing a small business and working in conjunction with unions.

An ESCO structure is appropriate for different types of projects. It is most efficient for capital intensive retrofits that use advanced technologies. It is also appropriate for aggregated small projects if the accumulated energy savings is significant and measurable. Because the income stream is performance-based, an ESCO has an incentive to use the best available technology, and to test new technologies on the market, thus expanding overall research and development.

An ESCO benefits both the supply side and demand side of energy efficiency in buildings. An ESCO finances retrofits and collects savings from utility bills for a period of time (anywhere from five to twenty years), until the retrofit is paid in full. The energy savings from the building upgrades are the revenue stream for the ESCO. Once the retrofits are paid off, additional energy savings are passed on to the person responsible for the energy bill.

To become accredited by NAESCO, the company must be categorized as an Energy Service Provider (ESP),

an Energy Service Company (ESCO), or an Energy Efficiency Contractor (EEC). An ESCO must prove its ability to take on projects upgrading the efficiency of an entire building, using multiple technologies, from the beginning phases (auditing) to the end (operations and maintenance). An EEC is only responsible for one portion of energy efficiency upgrades, such as a specific technology like lighting or HVAC systems. To obtain accreditation, NAESCO evaluates a company’s technical and managerial competence to develop projects and provide said services. Business practices, including actual energy efficiency cost savings and compensation, are evaluated as well.

There are significant risks and barriers associated with forming an ESCO. First, the ESCO needs to secure long-term financing for capital-intensive projects. The payback period may be relatively long, therefore funding from grants or low interest loans are preferable in the beginning stages. The political climate can also affect the success of an ESCO.

Once in business, the company bears all the risk. If the retrofits do not perform as well as anticipated, or if energy savings are not significant, it may be difficult for the ESCO to repay its financing. Also, due to the long repayment period, the ESCO must stay in business long enough to recover the capital expenditures. Furthermore, the building in which the project took place must also be able to pay utility bills for five to twenty years.

By combining the training program with the ESCO formation, the company can potentially achieve 501c(3) non-profit tax exempt status and become a public sector member of NAESCO (upon accreditation), which costs only \$250 per year (as opposed to \$6,000 for a private ESCO). The company must be functioning well prior to application for accreditation by NAESCO, but there are no legal requirements to form an ESCO of this type.

The funding available for a small business can support an ESCO as well, and federal funding from the Energy Independence Act may become available, if the ESCO is creating jobs. See Figure 16 for ESCO funding sources and Appendix IX for additional information on ESCOs.

Based on the previous chapters highlighting current building retrofitting procedures, monetary and non-

monetary partnerships, job placement strategies and a recommendation on the content and structure of a retrofit training program, our consulting group is pleased to present a primary recommendation for Sustainable South Bronx. The following section delineates this recommendation and the explanation behind this recommendation.

Figure 16: Funding Sources for Option D: ESCO

Agency	Time Frame	Feasibility	Amount	Type	Use
<i>Federal</i>					
United States Dept. of Labor: Green Jobs Act	1 year	Medium-High	TBD	Grant	Training
United States Dept. of Energy: Energy Efficiency and Conservation Block Grant Program	1-2 years	Medium	TBD	Sub-grant	Training and job placement
<i>State</i>					
NYSERDA: Peak Load Reduction Program	N/A	Facility owner/ operator or service provider only	\$37,000,000 in incentives	Grant	Job placement

Recommendation: Combine Approaches to Maximize Job Placement

The final post-training job placement recommendation is based on the following criteria:

- Create as many jobs as possible in the South Bronx area;
- Produce and utilize a path that optimizes feasibility for implementation of the recommendation by the Sustainable South Bronx organization;
- Incorporate the maximum amount of available funding in the form of government programs, grants, investments and loans; and
- Increase the ability and flexibility of employing an increased number of workers as the market for retrofitting services expands.

The small business approach has the maximum job placement potential, the highest level of feasibility and the greatest amount of available funding. At the same time, however, SSBx can immediately begin direct placement of employees. Thus, a multi-faceted job placement strategy poses the utmost adherence to the above criteria.

Therefore, the recommended approach is a combination of the following immediate, mid-term and long-term goals and opportunities.

Immediate: Direct Placement and Partnerships

SSBx can immediately begin to place trainees in jobs when the G.R.E.A.T. Program is launched, using the organization's current direct network of companies. Union placement and apprenticeships may also be

considered, by using the training program as a pre-apprenticeship program, thus establishing union contacts. SSBx can also begin forming new partnerships with additional organizations.

Mid-Term: Small Business

Building retrofit projects can immediately be integrated into the SmartRoofs business and SSBx can determine whether to create a new business or utilize the existing structure. These new business services will include building retrofit services and assistance with NYSERDA incentives to help homeowners finance their projects. Once the business grows to employ several experienced journey workers, the business can apply to become an apprenticeship sponsor.

Long-Term: ESCO

As the retrofit business matures, SSBx can weigh the possibility of becoming an ESCO, based on the demand for capital-intensive projects. These projects require long-term financing. As an ESCO, SSBx can offer to finance large projects using the revenue saved from increased efficiency. The payback period will be significant. Thus, once SSBx becomes an ESCO, SSBx must plan accordingly.

This Primary Recommendation represents the potential of Sustainable South Bronx to continue its mission and to inspire other nations across the globe to green their own communities through innovation and equality.

Immediate Opportunities	• Direct Placement • Form partnerships with unions and other organizations
Mid-Term Opportunity	• Implement small business structure
Long-Term Opportunity	• Become an energy service company (ESCO)

Concluding Remarks



In an attempt to create a template for green collar jobs, our consulting group explored the building retrofitting sector and designed a building retrofit training program, entitled G.R.E.A.T., or Green Retrofit Education and Training Program.

There are two interdependent parts to this program. The first is job training and the second is job placement. The job training planning begins with an assessment of building retrofitting. The general process includes auditing, used to identify potential upgrades, in conjunction with installation and maintenance of the recommended upgrades.

After looking at the technology and assessing the success of other job training programs such as Sustainable South Bronx's Bronx Environmental Stewardship Training Program, or B.E.S.T., our consulting group recommends a training curriculum that includes life skills, technical retrofit training, supporting skills and a hands-on practicum.

Life skills promote job retention and include team building, time management, financial management and an overview of issues that may arise in a typical workplace. Technical training covers technology and provides graduates with necessary training certifications to work in the industry. Supporting skills teaches trainees why it is important to mitigate carbon emissions and helps them understand the importance of their job. The hands-on practicum allows trainees to retrofit a local building, which helps to green The Bronx and provides trainees with on-the-job experience.

Once the training is completed, it is necessary to follow up with job placement. We have identified four different strategies to place graduates of the G.R.E.A.T. Program into careers and we recommend Sustainable South Bronx use a combination of these to maximize job creation. These strategies are direct placement, utilization of union programs, creation of a small business and, lastly, development a different type of small business, an Energy Service Company, or ESCO.

Direct placement for program graduates is already available. Sustainable South Bronx has a job placement network available for graduates of the B.E.S.T. Program, which can potentially be expanded to accommodate G.R.E.A.T. graduates as well. External organizations are also available for job placement.

Similar to direct placement, Sustainable South Bronx can form relationships with local unions and other union placement programs. SSBx can launch a pre-apprenticeship program to provide training sufficient for entrance into apprenticeship programs. In the future, SSBx can become an apprenticeship sponsor.

Coupled with direct placement, Sustainable South Bronx can choose to place G.R.E.A.T. graduates in their own small business. A new business may be established to offer building retrofits, or SSBx's current business, SmartRoofs LLC can use the benefits of tenure and expand to include other types of building retrofits while bypassing initial startup costs associated with a new business.

As the market becomes more sophisticated, the small business may choose to expand and add a dimension of financing as an ESCO. We recommend an ESCO that provides the capital cost, building audit, upgrade installation and maintenance, and that collects energy savings as income. The payback times vary depending on the success of the technology, but may be anywhere from five to twenty years, which makes this a long-term option.

In order to implement the job training program or placement strategies, potential partnerships and funding opportunities have been identified. These are divided into two categories: monetary and non-monetary partnerships. Monetary partnerships provide sources of funding to the organization and include federal funding such as the Energy Independence Act of 2007. State and local agency funding includes organizations such as NYSEDA, which offers incentives to address the demand and supply aspects of retrofitting. Private funding is also available in the form of grants, loans and investments.

Non-monetary partnerships are necessary for a variety of reasons. Sustainable South Bronx will need partners to assist with training, job placement networks, and to aid in determining the best practice guidelines for the industry. There is also potential to work with unions as a previously established and very strong workforce within the City.

However, our research shows that challenges exist. Building retrofitting is not yet mandated and is still considered a luxury service, which makes it vulnerable

to economic fluctuations, more so than general construction, which is already a boom and bust cycle. There is also a lack of comprehension among industry professionals and organizations. In addition, there is no set standard for retrofit technologies or certifications for contractors. The funding available from federal and state governments is in its infancy and distribution mechanisms are not yet established. Finally, because funding is limited and the market is new, there is a considerable amount of competition. There are multiple organizations that would like to be at the forefront of this movement. Labor unions typically dominate the construction industry and may or may not be willing to partner with other non-union organizations. On a positive note, this competition also demonstrates the remarkable growth of this industry.

Finally, our consulting group has recommended that Sustainable South Bronx continue to expand their network of partners, initiate funding sources and cultivate growth to foster a successful building retrofit training program. Next, a technology analysis should be conducted to determine what may be taught in house and what should be outsourced. Lastly, this design should be tailored to fit the specific needs of Sustainable South Bronx and the logistics of the training program.

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Appendix

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Appendix I.

Case Study 1: D.C. Greenworks Green Collar Job Training Program

Background

“D.C. Greenworks’ Green Collar Job Training programs are a successful marriage of ecology and economy, a living demonstration of how employment and natural resource conservation support and sustain one another. Our apprenticeship programs address both the need for clean and green communities as well as for education, job training, and employment opportunities. Our goal is to build a workforce of individuals educated and trained in urban landscape management and associated environmental best practices.”

(<http://www.dcgreenworks.org/Training/home.html>)

Potential Partnerships

- Dawn Gifford, Maryland Community Resources (specifically for Low Impact Development initiatives)
- KC Trees (KC Trees is endowed)
- Earth Conservation Corps (funded like Americorps)
- Goodwill

Earth Conservation Corps Partnership with D.C. Greenworks:

- Teams of ten people each (for large jobs only)
- All workers receive stipend
- D.C. Greenworks pays Earth Conservation Corps

Lessons Learned

It is clear from meeting with Sarah Murphy, Assistant Director of D.C. Greenworks, that the success of D.C. Greenworks is limited by a several factors:

- Lack of support and structure for employees: Employee salaries are solely funded by the commission earned from installing green roofs. Currently, there is no federal money that is being used to fund employee salaries. Furthermore, Sheila Hogan, Executive of D.C. Greenworks, is a part-time employee and thus there is a lack of continuity between staff members. Sarah Murphy is the only full-time employee and she has been forced to complete green roof commission jobs on her own on more than one occasion, due to a

dwindling and unreliable staff.

- Disconnect and lack of communication between D.C. Office of Planning and D.C. Greenworks: The D.C. Office of Planning actively promotes D.C. Greenworks, but the Office seems to have no knowledge of the lack of funding for the program, the lack of funding for employees, and the fact that the organization is severely understaffed.
- Lack of comprehensive funding structure: D.C. Greenworks is a non-profit organization and since profits are made solely on commission (green roof installation and Low Impact Development initiatives), D.C. Greenworks is currently \$50,000 in debt.
- Lack of comprehensive training program in the face of substantial PR: The promotion of and PR surrounding D.C. Greenworks is strong: D.C. Greenworks is the “go-to” green roof installation organization in the Washington D.C. area. However, the training program used at D.C. Greenworks is not successful and is severely lacking in soft skills. Graduates from the training program do not seem to internalize the skills and lessons taught during the training and more often than not, do not complete the work assigned to them or are fired from the job, further adding to the staffing issues. It is clear that this lack of a comprehensive training program is a major difficulty and roadblock for this organization. Sarah Murphy described in detail the need for a training program that includes soft skills, illustrating the need and importance of teaching soft skills.

Appendix II.

Case Study 2: Association for Energy Affordability

Background

505 Eighth Avenue, Suite 1801

New York, NY 10018

(212) 279-3902

www.aeanyc.org

The Association for Energy Affordability is a non-profit training and technical services organization funded by the New York State Division of Housing and Community Renewal (DHCR).

Affiliations

- New York State Division of Housing and Community Renewal (DHCR)
- United States Department of Energy: New York State Weatherization Program (WAP)
- NYSERDA: Multifamily Performance Program
- Building Performance Institute
- Hudson Valley Community College: Workforce Development Institute

Services

- Energy audits and retrofit implementation for NYSERDA and WAP programs
- Green New Construction Group offers LEED consulting
- Install and maintain energy management technologies
- Building science research and demonstration pilot projects
- Energy management training (contact: Taina Palombo-Price at (718) 292-6733 x210 or tainap@aeany.org)
- Weatherization
- Energy efficiency building operations
- Multifamily building analysis
- New York State Department of Housing Preservation and Development: Housing Education Program

• Local 32: Heating training

The Association for Energy Affordability, Inc. (AEA) is a not-for-profit training and technical services organization, committed to using energy efficiency to maintain affordable and healthy housing for low- and moderate-income families and communities. AEA provides services to a diverse network of community-based organizations that are local sub-grantees of New York State's Weatherization Assistance Program (WAP), administered by the New York State Division of Housing and Community Renewal (DHCR) and funded by the United States Department of Energy. AEA is also an affiliate of the Building Performance Institute (BPI), providing both training courses leading to BPI certification and proctoring services for BPI written and field exams.

The AEA Energy Management Training Center in the AEA's Bronx Weatherization Department provides direct weatherization services to income eligible residential properties in the South Bronx. The AEA Training Center facility offers hands-on training opportunities, a wireless building control lab and several classrooms equipped with digital video, internet access and computer presentation capabilities. The Center is also a showcase and training facility for advanced building controls and renewable technology.

The AEA Energy Management Training Center thus provides an excellent resource for building management and energy professionals interested in gaining technical expertise in energy management. AEA offers a wide variety of technical training opportunities for weatherization staff, boiler contractors, property managers, building superintendents, energy auditors, heating system designers and other energy professionals interested in learning more about how to improve energy efficiency and overall performance of multifamily buildings.

Appendix III.

Case Study 3: Community Environmental Center

Background

43-10 11th Street
Long Island City, NY 11101
(718) 784-1444

www.cecenter.org

- Located in Long Island City and run by president and CEO, Richard Cherry
- Employs over 70 workers
- Established to service low income households (mostly in Brooklyn), but has since branched out to service commercial, industrial, medical and educational facilities
- Employment: Under NYSERDA guidelines, they hire BPI certified auditors

Affiliations

- Build it Green! NYC: Low cost salvage of surplus building materials
- SolarOne: Green energy arts and education center

Services

- One to four member family homes:
 - BPI certified audits
 - Heating and cooling
 - Building envelope
 - Appliances and lighting
 - Air quality
 - Health and safety
 - Distributes government funding to offset costs
- Apartments and commercial buildings:
 - New construction and major renovation
 - Existing buildings
 - Auditing and LEED services
 - Partners with NYSERDA to provide financial incentives
- Green contractor services:
 - Cellulose insulation
 - Air sealing
 - Tobacco smoke control testing

Appendix IV.

Case Study 4: Oakland Green Jobs Corps – A program of the Oakland Apollo Alliance

Background

The Oakland Green Jobs Corps three-month training program not only includes vocational hard skills, but also a class module on “environmental global awareness,” in order to provide trainees with a background of the global climate crisis and to help them understand how their work is part of a larger national and global effort. In addition, the training also offers modules on personal finance management, OSHA Safety Training Certification, “Labor Unions 101 – How to Get into Union Apprenticeship Programs,” as well as other specialized support services deemed critical to the success of the trainees, such as assistance with child care and nutrition.

The Oakland Green Jobs Corps (“Corps”) is a project of the Oakland Apollo Alliance (OAA) – a coalition of labor unions, environmentalists, green businesses and CBO’s – that has the support of Mayor Ron Dellums, several members of the Oakland City Council and key city staff in the Public Works Agency and the Community and Economic Development Agency. The main goal of Corps is to provide viable job opportunities for young adults while simultaneously promoting environmental stewardship. The Corps is projected to launch in early 2008.

OAA will oversee the following responsibilities:

- Serve as the “single point of contact” for the initiative; be accessible and marketable to potential partners; coordinate logistical details; forge key relationships;
- Create and convene a “Green Business Council.” After an inventory of green businesses was completed, invitations were sent out to each business to join the green business council. The council will help to create the curriculum and provide internship positions for Corps trainees. Most of these businesses are small or medium-sized firms, which will be able to employ one to three interns at a time; and
- Secure seed funding: OAA has secured \$250,000 in seed funding from the Oakland City Council. These funds were approved in 2007, and were the result of a special lawsuit settlement against Williams-

Reliant Energy. Matching funds from a workforce-training program and other long-term sources will be required.

The Corps curriculum was developed by OAA with the help of local, regional, and national experts. It contains the following five components:

- **Recruitment and Outreach:** The Corps looks to recruit 40 young adults (age 18 to 35) with barriers to employment. Points of contact for this include: community-based programs, labor unions and educational institutions.
 - **Phase I: Three-Month Training:** Recruits will be enrolled in a three-month training program. This phase is made up of both classroom and hands-on training. Classroom training will cover a wide range of topics including: “life skills” (literacy, financial management and job readiness), “environmental global awareness,” environmental sustainability, environmental justice, OSHA training and “Labor Unions 101.” Half of each week will also be spent on hands-on vocational training; students are paid during these hours. During this phase, the Corps will provide participants with “wraparound services,” that is, assistance with child care and transportation.
 - **Phase II: Six-Month Paid Internships:** After completing Phase I, trainees will be placed in six-month paid internships with employers from the Oakland Green Business Council. They will be paid a living wage by employers, and the Corps will provide case management and specialized support services to help ensure success.
 - **Graduation:** Upon the conclusion of their internships, trainees will be honored with a high-profile graduation.
 - **Career options:** After graduation, the Corps will assist graduates with job placement. Potential paths for students include: employment with a member of the Oakland Green Business Council, union apprenticeship programs, or higher education. Case management and job retention services will be provided to graduates for at least one year after graduation.
- Source:

http://www.ellabakercenter.org/downloads/rtf/oakland_green_jobs_corps_summary.pdf

Appendix V.

Case Study 5: Sustainable South Bronx's B.E.S.T. Program

SSBx runs the Bronx Environmental Stewardship Training (BEST) program, which takes qualifying students through ten weeks of intensive training, covering tree pruning, estuary maintenance, green roof installation, hazardous waste clean-up, asbestos abatement, water and soil quality testing and Occupational Safety & Health Administration (OSHA) brownfield remediation, in addition to job and life skills.

The B.E.S.T Program is free to qualified applicants and gives local residents a personal and financial stake in the management of their local environment. Students graduate with several certifications, job readiness preparation, and a perspective on environmental justice. SSBx also works with graduates to help them find a suitable job and tracks their progress for three years.

In December 2006, Mitsubishi International Corp contributed \$150,000 to expand this successful endeavor.

Appendix VI.

Job Placement Organizations

- The Worker Career Center (WCC) is a subsidiary of the Consortium for Worker Education, which assists New York City Central Labor Council affiliated union workers. WCC places workers with all employers. WCC has partnered with New York City Department of Employment, New York State Department of Labor, and New York City Human Resources. Workers attend an orientation held at the Bronx location (358 East 149th Street, Bronx, NY 10455) and after adequate training experience, are directed to a job application.
- South Bronx Overall Economic Development Corporation (SoBro) connects workers with over 400 businesses and organizations for employment.
- The New York Industrial Retention Network (NYIRN) is another organization that offers training assistance for small businesses, and also offers local job placement assistance. For more information about NYIRN's job placement program contact Jayant Kairam at jkairam@nyirn.org and view the NYIRN website at www.nyirn.org.
- The Heart of Brooklyn project is a cultural partnership between Brooklyn Botanic Garden, Brooklyn Children's Museum, Brooklyn Museum, Brooklyn Public Library, Prospect Park, and Prospect Park Zoo. A 2006 Bank of America Neighborhood Builders Award funds this project. Heart of Brooklyn offers a camp for children, outreach, research and marketing programs to benefit local residents and cultural organizations, as well as a tourism initiative. They also have a partnership with the Center for Employment Opportunities (CEO). Through the CEO partnership Heart of Brooklyn hires people experiences barriers to employment and utilizes their services for green work. In this context they are providing job training and then placing workers in different categories in different fields. At present there are 10 to 15 formerly incarcerated persons and one co-coordinator working as maintenance crews on Washington Avenue and Flatbush Avenue. This project will last for one year with hopes that workers will gain enough experience to acquire other available green jobs in New York City.

Appendix VII.

Potential Partnership: New York City Business Solutions

New York City Business Solutions is an initiative of the New York City Department of Small Business Services. The Business Solutions website serves as an information clearinghouse for a broad array of services and partners related to small business start-up, hiring and training assistance, financing, and management.

Training Assistance

New York City Business Solutions provides training funds to New York City employers to support workforce development and “promote career advancement for employees.” The program can provide up to \$400,000 to fund 60 to 70 percent of eligible training costs. Employers must pay the remaining 30 to 40 percent. Sustainable South Bronx, in order to be eligible for these funds, must either: 1) start their own individual business, or 2) partner with two or more businesses with similar training needs, and apply for the funds as a consortium. These businesses may include associations, labor unions, and training providers. Additional requirements include the acquisition of a minimum fund threshold of \$10,000 and an agreement to train at least ten employees.

Application Evaluation Criteria

(<http://www.nyc.gov/html/sbs/nycbiz/html/hiring/training.shtml>)

Statement of Need and Feasibility of Program

- Explanation of the expected profitability gains from training and the business need for Training Funds

- Likelihood that proposed training program will address the business need, result in targeted outcomes, and be completed on-time
- Evidence that the applicant possess administrative resources and commitment necessary to managing the program

Wage Gains and New Hires

- Relative size and timeframe of trainee wage increase directly attributable to training
- Impact on low-income New Yorkers (defined as those who make \$15 per hour or less)
- Number of new hires

New or Upgraded Skills

- Explanation of how the training will help employees to perform current or new responsibilities more effectively
- Evidence that training strengthens employee skill sets that are applicable across one or several industries
- Indication of how skill increases will be measured

Budget and Leveraged Impact of Program

- Explanation of budget components and their role in the training program
- Reasonable and fair costs relative to comparable training in the industry
- Cost/benefit analysis (size of expected wage gains and number of new hires relative to the training budget)

Training Funds Calendar*

	Winter 2007	Spring 2008	Summer 2008
Pre-application Available	December 13	March 17	July 23
Pre-application Due	January 22	April 15	August 14
Applications Due	February 19	May 15	September 8
Awards Announced	March 28	June 26	October 24

*These dates are subject to change

Application Evaluation Criteria

(<http://www.nyc.gov/html/sbs/nycbiz/html/hiring/training.shtml>)

Appendix VIII.

New York City Certification Program

http://www.nyc.gov/html/sbs/nycbiz/html/selling_to_government/wbe.shtml

If SSBx decides to establish a small business, it would be beneficial to become New York City Certified. Local Law 129, which was signed by Mayor Bloomberg in 2005, requires that city agencies buy more goods and services from certified Minority- and Women-owned Business Enterprises (M/WBE). That gives more opportunities to certified M/WBEs to bid on public contracts, increase their capacity and effectively contribute to the City's economy.

To qualify for certification into the M/WBE program, a company must be:

- In business for at least one year; and
- At least 51 percent owned, operated, and controlled by a woman or a member of a recognized minority group, including Asian American, African American, Hispanic American, or Native American.

To apply for EBE certification, a company must be:

- In business for at least one year; and
- At least 51 percent owned, operated, and controlled by persons who can demonstrate social and economic disadvantage.

Benefits of Certification

Becoming certified as a MBE (minority-owned business), or an EBE (emerging business) offers substantial benefits:

- More opportunities to bid on contracts and subcontracts under \$1 million

The City of New York buys billions of dollars of goods and services each year.

- Free advertising in the New York City Online Directory of Certified Companies

This searchable electronic directory makes it easy for buyers to find certified businesses and to find other potential partners.

- Free assistance with bids and proposals

Attend "Selling to the Government" classes or meet with a procurement counselor to learn how to bid successfully.

- Free education courses

The Department of Housing Preservation and Development offers free courses in lead abatement, Water and Energy Conservation and Building Heating Systems. For more information, see

<http://167.153.4.72/hepclasses/ViewClassList.aspx>.

Appendix IX.

ESCO Organizations: Additional Information

Additional Information:

<http://www.coned.com/escos>

New York Independent System Operator:

<http://www.nyiso.com>

Con Edison Retail Access Implementation Plan:

<http://www.coned.com/escos/electric/opagreemt.asp>

Electronic Data Interchange (EDI):

<http://www.coned.com/escos/edi/index.asp>

Power Your Way template:

[http://www.coned.com/escos/documents/
PYWTemplate.pdf](http://www.coned.com/escos/documents/PYWTemplate.pdf)

RAIS training (March 2008)

[http://www.coned.com/escos/TrainingPresentations/
RAIS_Dec2007.pdf](http://www.coned.com/escos/TrainingPresentations/RAIS_Dec2007.pdf)

National Association of ESCOs:

www.naesco.org

Examples of Companies Functioning as ESCOs:

- Efficiency Energy is an example of for-profit that is not currently an ESCO, but will take the same approach to funding projects: <http://www.wesavegreen.com/>
- Atlantic Energy is a member of NAESCO
www.atlanticenergy.net

Appendix X.

NYSERDA: Additional Information

Program	Target Audience	Description	Value	Key Dates	Contact
Home Performance With ENERGY STAR	Owners of existing 1- or 2-family homes	Low interest loan financing for energy efficiency improvements	\$15,000/\$20,000	Ongoing	NYC \$mart Communities Regional Coordinator, SOBRO, Ellysa Rothe, 718-732-7532
New York ENERGY STAR Labeled Homes	Owners of newly constructed homes	Access list of builders certified to build energy efficient homes	Lower monthly utility bills. Low-income households: \$500 cash incentive	Ongoing	NYC Energy \$MART Communities Regional Coordinator, SOBRO, Ellysa Rothe, 718-732-7532
Assisted Home Performance	Low-income households	Help cover costs of energy efficiency improvements for low and moderate income households	Max of \$5,000 per household or \$10,000 for 2-4 family building	Ongoing	NYC Energy \$MART Communities Regional Coordinator, SOBRO, Ellysa Rothe, 718-732-7532
EmPower New York	Customers of participating electric utility living in a building with 100 units or less, and have a household income below 60 percent of the state median income	Full cost reimbursement of lighting and refrigerator replacements and insulation measures	Cost of lighting, refrigerator replacements and insulation measures	Ongoing	NYC Energy \$MART Communities Regional Coordinator, SOBRO, Ellysa Rothe, 718-732-7532
Low-Income Home Energy Assistance Program (HEAP)	Low-income households	Help households pay for heating costs	Based on income and percentage of income spent on energy	Ongoing	NY State Office of Temporary and Disability Assistance (OTDA), 1-800-342-3009
Multi-Family Performance Program	Renters	Audits and retrofits areas of building where there can be savings on energy costs. Special incentives are rewarded based on advanced energy measure	\$1,000s	Ongoing	1-877-NY-SMART
New York Energy Smart Loan	1-4 family, multi-family, new construction homeowners and owners of commercial buildings	Loans are subsidized for making energy efficiency improvements on home	\$30,000 - \$2,500,000	Loan terms effective 9/1/07 – 7/31/09	1-866-NYSERDA or 518-862-1090 (Albany, NY)
Inefficient Air Conditioner Rebate	All	Rebate for replacing inefficient A/C with new ENERGY STAR model	\$100 per A/C	Ongoing	1-866-NYSERDA or 518-862-1090 (Albany, NY)
Keyspan Energy Efficiency Incentives	Keyspan gas customers	Rebates based on projected gas savings	\$150 - \$6,000	Ongoing	Keyspan 1-800-843-3636
ConEdison Gas Efficiency Performance Program	ConEdison gas customers	Low financing or cash back for energy efficiency improvements made to home	25 percent cash back or incentive based on gas savings	Ongoing	1-877-NY-SMART
Energy Audit Program	Small businesses and non-residential buildings	Provides recommendations for energy efficient measures	Cost of energy savings in building	Ongoing	1-866-NYSERDA or 518-862-1090 (Albany, NY)

Appendix XI.

NYSERDA and Partners Incentives Resources

Home Performance with ENERGY STAR

Target audience: Owners of existing one or two family homes

Value: \$15,000 or \$20,000

Key dates: Ongoing

Contact: NYC Energy \$MART Communities Regional Coordinator

SOBRO, Ellysa Rothe, 718-732-7532

Description: Low-interest financing for an unsecured loan (it is not a second mortgage or equity loan) of \$15,000 or \$20,000 (depending on credit score) for a term of three, five, seven or ten years for retrofit work performed by a participating Building Performance Institute (BPI) Accredited Home Performance Contractor. Payment is made directly to the contractor after a signed Certificate of Completion is received.

The BPI Accredited Home Performance Contractor performs an energy audit of the home, makes recommendations for energy improvements, provides a cost estimate to do the improvements and completes the work.

NY ENERGY STAR Labeled Homes

Target audience: Owners of newly constructed homes

Value: Lower monthly homeowner utility bills. NY ENERGY STAR labeled homes use approx. 30 percent less energy than conventionally-built homes. Low-income households receive a \$500 cash incentive.

Key dates: Ongoing

Contact: NYC \$MART Communities Regional Coordinator: SOBRO, Ellysa Rothe, (718) 732-7532

Description: Owners of newly constructed homes can access certified builders who are qualified to build energy efficient homes using energy saving technologies and building practices to ensure the home is as energy

efficient as possible.

Assisted Home Performance

Target audience: Low-income households

Value: Covers up to 50percent of costs associated with energy efficiency improvements, up to a maximum of \$5,000 per household, or \$10,000 for a 2-4 family building.

Key dates: Ongoing

Contact: NYC \$MART Communities Regional Coordinator: SOBRO, Ellysa Rothe, 718-732-7532

EmPower New York

Target audience: Electric distribution customers of a participating utility who live in a building with 100 units or less, and participate in a utility payment assistance program or have a household income below 60 percent of the state median income

Value: Full cost of lighting and refrigerator replacements and insulation measures

Key dates: Ongoing

Contact: NYC \$MART Communities Regional Coordinator: SOBRO, Ellysa Rothe, 718-732-7532

Description: Full cost reimbursement of electric reduction measures such as lighting and refrigerator replacements, and home performance strategies such as insulation. Honeywell International is the company contracted to implement the program, while private contractors conduct the energy efficiency measures.

Low-Income Home Energy Assistance Program (HEAP)

Target audience: Low-income households

Value: Household benefits are based on income and the percentage of income spent on energy

Key dates: Ongoing

Contact: NY State Office of Temporary and Disability Assistance (OTDA), 1-800-342-3009

Multi-Family Performance Program

Target audience: Renters

Value: Several thousand dollars depending on the number of apartment units and whether it is affordable or market-rate housing

Key dates: Ongoing

Contact: 1-877-NY-SMART

Description: Program assesses the energy needs of a building and works with contractors to retrofit a building according to benchmark performance standards agreed in an energy reduction plan. During different stages of achieving the energy reduction plan, payments are forwarded to the contractor that has successfully done the upgrades.

Special Incentives are rewarded for advanced measures that are installed such as advanced meters used for sub-metering, combined heat& power systems, or photovoltaic systems. Also each attendee who completes a building operator training is reimbursed after certification.

New York Energy Smart Loan

Target audience: 1-4 family homeowners, multifamily homeowners, new construction homeowners, and owners of commercial buildings

Key dates: Loan terms are effective 9/1/07 – 7/31/09

Contact: 1-866-NYSERDA or 518-862-1090 (Albany, NY)

Inefficient Air-Conditioner Rebate

Target audience: All

Value: \$100 for each inefficient air conditioner

Key dates: Ongoing

Contact: 1-866-NYSERDA or 518-862-1090 (Albany, NY)

Description: Receive a rebate when old inefficient air conditioners are replaced with ENERGY STAR models.

Keyspan Energy Efficiency Incentives

Target audience: Keyspan gas customers

Value: \$150-\$6,000

Key dates: Ongoing

Contact: Keyspan 1-800-843-3636

Description: “Provides technical and financial assistance to its customers. Keyspan helps fund the recommended energy saving measures by offering rebates based on projected savings. Rebates are available up to 50 percent of the project that cost up to \$100,000. Cash rebates are also given to help cover the cost of furnaces, boilers, infrared heaters, and water heaters. Amounts vary according to size and type of heating equipment installed and range from \$150 to \$6,000.”

ConEdison Gas Efficiency Performance Program

Target audience: ConEdison gas customer

Key dates: ongoing

Contact: 1-877-NY-SMART

Description:

Homeowners- Financing as low as 1.99 percent APR or up to 25 percent cash back when energy efficient improvements are made to home. Improvements consist of installing energy efficient boilers, furnaces, or water heaters, new windows, appliances, lighting and doors, and insulating the home.

Multi-Family Building Owners – “Building owners receive incentives for custom gas measures based on savings from technical studies. Buildings qualify for an incentive based on either \$2.00 times the estimated annual gas savings of the proposed custom gas improvement for market rate buildings, or \$2.50 times the estimated annual gas savings for affordable housing.”

Energy Audit Program

Target audience: Small businesses and non-residential buildings

Value: Cost of energy savings

Key dates: ongoing

Contact: 1-866-NYSERDA or 518-862-1090 (Albany, NY)

Description: Provides recommendations for energy efficient measures

Source: www.getenergysmart.org

Appendix XII.

Information on Post-Training Apprenticeships for Graduates

Post-training employment:

After completing the training program trainees will have a higher likelihood of employment with contractors that have agreed to hire trainees from the training program. These partners may be able to hire workers permanently once workers illustrate they are reliable and capable of doing the work. Creating partners and arranging hiring agreements will ensure short-term and long-term employment of workers in non-union jobs.

Long-term employment is likely if trainees are awarded apprenticeship positions. The apprenticeship programs available for building retrofits would include all the programs that train workers with the specific trade skills required to conduct a complete retrofit. This includes electrical, plumbing, HVAC and general construction. The particular apprenticeship program that trainees choose to apply for is dependent upon their desired career path. Current recruitments into apprenticeship programs are listed on the New York State Department of Labor's website: <http://www.labor.state.ny.us/pressreleases/ApprenticeshipArchive.shtm>.

Workers wishing to enter into an apprenticeship program are required to go through the apprenticeship application process of the Department of Labor (DOL). The application period is based on industry demand and is determined by the labor unions under the supervision of the DOL. During the application period applicants submit an application card. At the close of the period 100 applications are drawn from a lock box and the chosen applicants are notified. The candidates must attend a one hour orientation and meet the following requirements:

- High school diploma or GED equivalent;
- United States citizenship or the ability to work in the United States;
- Social Security card; and
- Minimum of 17 or 18 years of age.

A criminal record does not preclude applicants from apprenticeships.

Upon satisfactory completion of the requirements, an oral interview is conducted. After passing the oral interview applicants are entered into the apprenticeship application record book for two years. Local unions use this list as new apprentice positions arise. Once a union decides to accept the apprentice the candidate must pass a drug test.

The apprenticeship application process and the limited availability of new apprentices limit the number of SSBx trainees that will be placed in these programs. It is recommended that SSBx build relationships with local union education directors to be notified of new recruitments before they are posted on the DOL website. Thomas Goodwin, Director of Education for the Steamfitters Local 638, actively recruits apprenticeship applicants by calling trade schools and other organizations when a new recruitment period is opening. He anticipates a new recruitment period starting in August 2008 to fill 80 new apprentice positions in the Steamfitters Local 638. Currently, they do not have a specific apprenticeship program for updating HVAC systems. Instead, workers are trained under the current apprentice program. This is due to the moratorium placed on creating new apprenticeship programs in New York State.

Ross Micali, member of the New York State Apprenticeship and Training Council and Director of Workforce Development at Monroe College in Rochester, New York, works in manufacturing of specialized optics used in new solar technologies. He has employers selected for sponsoring new apprenticeship programs and is waiting for the moratorium to end in August 2008. Once it is lifted, employers can update their existing programs or start new programs that train workers in "greener" skills.

Appendix XIII.

PlaNYC Green Job Creation: Additional Information

During the implementation phase of PlaNYC (2007-2030), over \$17.1 billion will be invested in energy efficiency initiatives. Initiatives five and eleven specifically create green jobs in the building efficiency sector (capital plans, construction, operations and maintenance). Initiative five is geared toward reducing demand among large energy consumers. It is estimated that \$12,160,000,000 of the \$17.1 billion will be allocated to implement this initiative. Cumulatively, this initiative will create 76,383 person years of employment.

Initiative eleven provides tax incentives for solar panel installation as well as financial assistance for the first climate neutral building in New York City, thus promoting the renewable energy market. \$21,400,000,000 of the \$17.1 billion will be allocated to implement this initiative. Cumulatively, this initiative will create 163 person years of employment.

Source: The Louis Berger Group, Inc. 2008. "Analysis of Job Creation in PlaNYC: Final Report."

Appendix XIV.

Sustainable South Bronx Program
Schedule and Timeline

Training Program - Monthly Schedule																												
2008				2009												2010				2011				2012				
June	July	September	October	December	January	February	March	April	May	June	July	August	September	October	November	December												
Training Program Set-Up				10 Week Training				Ongoing 10 Week Training Programs																				
Hire Program Staff																												
Space Allocation for Program and Administrative Staff																												
Curriculum Development						Pre-Apprenticeship Training																						
Job Placement Program - Monthly Schedule																												
Option A – Direct Placement																												
Hire Placement Manager		Develop Partnerships with Job Placement Opportunities																										
						Job Placement of Program Graduates																						
						</																						