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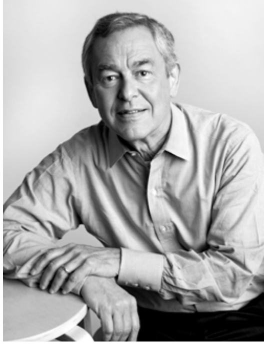

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Biography

Bob Fox is one of New York City's most highly respected leaders in the green building movement. He serves on numerous boards and advisory committees, speaks widely about green building, and has been honored with many awards, including a Leadership Award from the US Green Building Council, and the Urban Visionary Award from the Cooper Union. A founding partner of Fox & Fowle Architects, Bob's work there includes the influential 4 Times Square/Condé Nast Headquarters. In 2003, Bob Fox joined with Rick Cook to form Cook+Fox Architects, a firm devoted to creating beautiful, environmentally responsible high-performance buildings, including the Bank of America Tower at One Bryant Park. In the summer of 2006, Bob joined Rick and Bill Browning to form Terrapin Bright Green LLC, a green strategic consulting firm. Bob received a Bachelor of Architecture degree from Cornell University and a Master of Architecture from Harvard University. He and his wife Gloria live in New York City and the Hudson River Valley.

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Abstract

Through four case studies – 4 Times Square, the Battery Park City Guidelines, The Bank of America Tower at One Bryant Park, and PlaNYC2030 – this paper presents tangible ways in which we might begin to think, act and design differently. The building industry is beginning to approach the design of buildings in a fundamentally different way, incorporating principles of sustainability from the outset and making directed changes with enormous potential.

Keywords: sustainability, efficiency, urban, skyscraper, LEED Platinum

Introduction

Provocation #1: The challenge before us today is to strike the word sustainability from our discussions of architecture. In just the past few years, there has been a radical shift in public attitudes such that sustainability – once exclusively championed by radicals of the far left wing – has now come to be seen as an essential component of any marketing, business, productivity, foreign policy or survival plan. As a consequence of this recent interest in making things work better, tremendous advances have been made in mechanical efficiencies, building operations systems, and new technologies. What we're headed for now is a fundamental shift in consciousness: an environment where the concept of architecture becomes inseparable from that of sustainability – so ingrained that it no longer even need be evoked – and where the built environment functions in a way similar to the natural one.

Provocation #2: Good architecture is often invisible. Architecture has traditionally been assessed through visible qualities such as form, proportion, and relationship to site. But if architecture is ultimately dedicated to the enhancement of our quality of life, then it must also address itself to principles that combine these qualities with environmental, historic and social sustainability issues. Certainly, buildings with adaptable, timeless appeal and historical significance are less likely to be torn down and, in this way, make their own contribution to sustainability. But unless they also include measures that lessen the effects of the building on the global environment as well as on its own inhabitants, retain some connection to its historic past, and improve the surrounding social fabric, they will ultimately lose their use value. Thankfully, architecture that utilizes access to natural daylight, improved air quality and ventilation, renewable energy sources, and passive operations to addresses concerns such as the state of mind it induces, and health and productivity, is also good for the bottom line.

Provocation #3: Dense living is green living. Cities, in general, and high-density skyscrapers in particular, may very well be our best, and most viable, option for efficiently inhabiting the planet. For example, New Yorkers produce 71 percent less CO2 per capita than the average American, largely because of the density of residential and commercial buildings and reliance on mass transit (The City of New York, 2007). Suburban sprawl, on the other hand, is currently overtaking precious agricultural land at a rate of 400,000 acres per year in the US (Brown, et al., 1998), causing the average American's commute to lengthen by approximately 3 minutes between 1990 and 2000 while the number of people walking or biking to work dropped by 25 percent during the same period (Harder, 2007). But skyscrapers too have their issues. Many, for example, need to be cooled all year round. This added cost can be tempered by taking advantage of assets that every building has for free – passive wind, sun, rain, earth, and biological processes. But at some point, skyscrapers reach a maximum capacity where building them any taller no longer makes economic sense. The challenge, then, becomes determining that critical balance: when the environmental benefits of dense living – in terms of transportation, living space, and energy required for upkeep – begin to be outweighed by the added costs of building to the stars.

Provocation #4: Conservation and efficiency are the world's best energy sources. Buildings of the future will not be powered by currently untapped fossil fuel reserves; they will be powered on our ability to think differently. Amory Lovins, co-founder of the Rocky Mountain Institute, once explained that: "There is a stark difference between efficiency and conservation… Conservation is a change in behavior based on the attitude, 'Do less to use less.' Efficiency is the application of technologies and the best practices to eliminate waste based on the attitude, 'Do the same or more with less'" (Heffern, 2001). Any approach to building must be predicated on using the least amount of energy possible and harvesting that energy exclusively from renewable sources. Since approximately 70 percent of energy is lost in its transmission across power lines, buildings must become producers of their own energy, achieving a true model of distributed and on-site power generation.

Perhaps only in hindsight do ideals such as these become apparent. While the four projects discussed in this paper were being developed, the nationwide views regarding the field of architecture, and on global climate change, were radically shifting. 4 Times Square, the Battery Park City Guidelines, The Bank of America Tower at One Bryant Park, and PlaNYC2030 were a part of this flood of indisputable, harrowing, life-changing statistics, perspectives, and offerings. It's now more well known that buildings are leading consumers of energy and emitters of the greenhouse gases responsible for climate change. In the US, the building sector accounts for 43 percent of carbon dioxide emissions, and buildings consume 71 percent of all electricity generated (Brown, 2005). In dense urban areas, buildings can represent *the* dominant source of emissions. For example, when New York City completed its first comprehensive Inventory of Greenhouse Gas Emissions in 2007, it was found that 79 percent of the city's carbon dioxide emissions come from its buildings (The City of New York, 2007). The United States, with only a small percentage of the world's population, is responsible for nearly 25 percent of worldwide carbon dioxide emissions (World Resources Institute, 2003). Buildings represent a large part of the problem, because as currently designed and operated, they waste enormous amounts of energy as well as clean water and other precious resources. But that's all about to change.

Setting the Standard: 4 Times Square

When plans for 4 Times Square were first conceived in 1995, the world was a different place. New York was coming out of a severe recession, brought on by an intense period of overbuilding in the 1980's coupled with the stock market "crash" in October 1987. There was not one construction crane on the Manhattan skyline. Hybrid and electric cars were seen as novelties, not yet captivating the general public's imagination, and the US Green Building Council, established in 1993, had yet to gain any real momentum. Given the specifics of the project at 4 Times Square, and the vision of the Durst organization, none of this seemed to matter as much as it might. Under the circumstances, aiming to design the country's first "high performance" skyscraper – "green" had yet to be adopted into the lexicon – and the City's first speculative building in nearly a decade, strangely enough, seemed like the most natural thing in the world to do.

Douglas and Jonathan Durst, the third generation to lead the Durst family, had already begun a concerted effort to renovate their existing buildings. They were well aware of the financial and other incentives for the efficient use of energy and had been systematically replacing outdated equipment and systems to improve the overall energy efficiency of their portfolio. When they created the opportunity to buy an important site in Times Square and build a 1.6 million square foot building, the direction this new building should take was obvious. 4 Times Square was, of course, an extension of the Dursts' previous work in building efficiencies. But the entire team – architect, engineers, construction manager, building managers, etc. – was strongly committed to testing the limits of sustainability and pushing this building as far as the current technology would allow.

The form the building would eventually take was shaped through an intensive design workshop, engaging key project members in a process of creative collaboration during the earliest stages of planning. Bringing representatives from state and federal agencies together with experts in high performance design, this "charrette" process helped to identify common goals which would later facilitate collaboration throughout the project, and helped to direct its most important aims. For example, the US Department of Energy's recently completed DOE2 energy model was utilized to test glazing, façade, and roofing systems in the design of a superior exterior envelope. The New York State Energy, Research and Development Authority (NYSERDA) offered their expertise and helped to fund the project. The Rocky Mountain Institute (RMI), an innovative, nonprofit institution focused on energy policy, usage and reduction, offered strategies to reduce energy consumption at 4 Times Square by implementing performance-based fees, in which the design team received financial rewards based on the energy-saving potential of their design. Appropriately, the design of the building incorporates many of these strategies – drawing information, ideas, and invaluable advice from various institutions and organizations – and demonstrates the achievements that can only be made through collective effort.

At 1.6 million square feet, this 48-story office tower, also known as the Condé Nast Building, was completed in January 2000. 4 Times Square became the largest building in the United States to incorporate state-of-the-art standards for energy conservation, indoor air quality, recycling systems, and products utilizing sustainable manufacturing processes. It also came to provide a centerpiece for the 42nd Street Master Plan prepared by the 42nd Street Development Corporation – a public/private consortium created to promote the redevelopment of the historical heart of Manhattan's theatre district. A massive effort was made to ensure that the building's design would mirror the dynamic, and brightly lit, atmosphere of Times Square while upholding the goal of energy efficiency and also retaining a stately presence in the context of midtown Manhattan. The motive for all of this was that it seemed the right thing to do: to create an efficient and healthy work environment, whose energy-efficiency financial pay-offs would materialize over the next several years.

Figure 1. 4 Times Square, New York © Jeff Goldberg/Esto

In order to incorporate high performance standards, building systems and construction technologies were both designed to work together to improve the building's overall efficiency and evaluated to determine their overall resource use. The building utilizes environmentally efficient gas-fired absorption chillers that eliminate the production of ozone-depleting chlorofluorocarbons (CFCs) along with a state-of-the-art curtain wall that makes smart use of the building envelope by providing both insulation and strength. The tower's structural hat truss significantly decreases the amount of steel used, and steel that was used was made from a high percentage of recycled content. Exploring new technologies, energy is generated on site through the use of building integrated photovoltaic panels in the building's curtain wall on parts of the east and south façades. Two phosphoric acid UTC fuel cells also serve the building, providing 400KW of clean renewable power. A network of recycling chutes services the entire building and the air delivery system provides 50 percent more fresh air than required by industry code – making the working environment feel noticeably fresher.

An important part of any design scheme is making sure that things work in the way they were designed. Engineers, building staff, and construction personnel were involved in the commissioning process for 4 Times Square's mechanical systems, resulting in improved operations, reduced energy consumption and operational costs. As part of the building's operational guidelines, measures were enacted during construction to prompt reduction and recycling of 65 percent of construction waste. Although these combined efforts certainly would have warranted certification from the US Green Building Council's Leadership in Energy and Environmental Design (LEED), the non-smoking prerequisite in LEED 1.0 prevented 4 Times Square from applying for LEED certification.

Now, nearly ten years since this project began, 4 Times Square continues to have resounding effects on the building industry. It was the poster child for the DOE for three years running and is still featured as a case study on their website, as well as on NYSERDA's. 4 Times Square was the lead building for the National Building Museum's 2003 exhibition: "Big and Green: Toward Sustainable Architecture in the 21st Century," and the subject of numerous conferences, lectures, panels, and articles. Visitors to the building continue to be offered tours that help to inspire similar green development.

Setting Guidelines: Hugh L. Carey Battery Park City Authority Environmental Guidelines

Designed by a team of architects, developers, and contractors to provide a foundation for improving the urban experience, Residential and Commercial/ Industrial Environmental Guidelines were created for the Battery Park City Authority (BPCA), a public-private entity that controls 92 acres of Lower Manhattan. The Guidelines were, in many ways, developed in tandem with a very early version of the LEED Rating System, but were tailored to the Battery Park City and New York City environment. Funded by NYSERDA and the Carrier Corporation, the guidelines became a local model for healthy, ecologically responsible building environments and marked a transformation in the market for green building. They are responsible for the creation of the first "green" residential tower in the United States: The Solaire. This tower grew out of a desire to respond to increased public awareness of environmental conservation and increasing demand for healthier, high quality living and working environments, the guidelines have been followed by all projects built in Battery Park City.

Five major categories frame requirements that each share a common environmental goal: Energy Efficiency, Enhanced Indoor Environment Quality (IEQ), Conserving Materials and Resources, Operations and Maintenance, and Water Conservation and Site Management. Energy Efficiency standards included a high-performance building envelope, thermal energy recovery, and on-site power generation, all leading to reduced energy cost. Indoor Environmental Quality (IEQ) standards focus on maximized access to daylight and outdoor views while improving Indoor Air Quality (IAQ) by requiring central fresh air delivery to be combined with well filtered air, and by minimizing chemical infiltration of spaces. Material and Resource standards go beyond the standard "reduce, reuse, recycle" by requiring 80 percent of construction waste to be diverted from landfill and the purchase and installation of recycled and rapidly renewable materials. Education, Operations, and

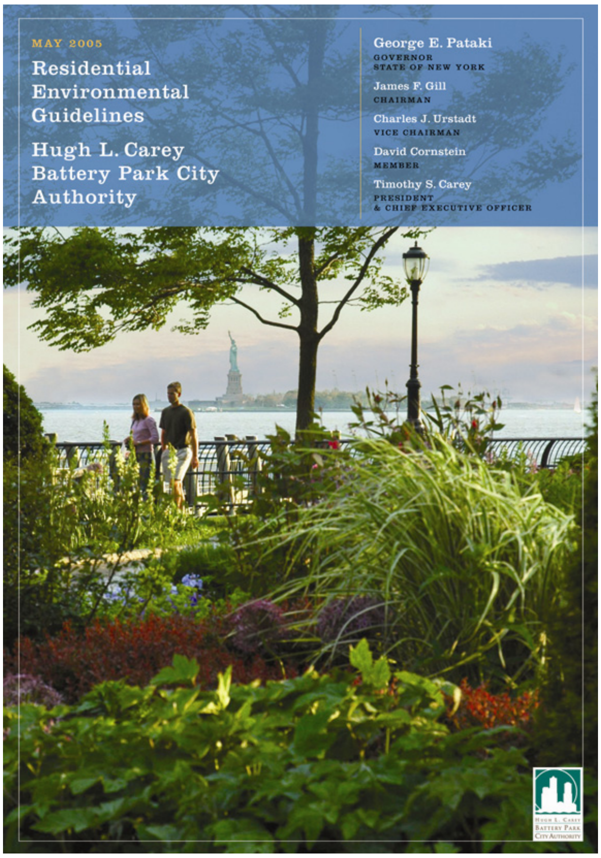

Figure 2. Battery Park City Residential Environmental Guidelines,

© Battery Park City Authority

Maintenance standards include the training of construction personnel, the development of green guides for tenants, and the commissioning and monitoring for all building systems. Water Conservation and Site Management standards include requirements to capture, treat, and use rainwater from roof and terraces; reclaim, treat, and reuse "black water" from toilets and other fixtures; create green roofs on 75 percent of the roof area and eliminate light trespass from building and site to preserve the quality of the night sky. By 2010 the Battery Park City guidelines will result in over five million square feet of LEED Gold buildings, the largest concentration of these buildings anywhere. With a contiguous community such as this one, the effects of sustainable living can be demonstrated in a powerful way.

Advancing the Cause: The Bank of America Tower at One Bryant Park

In mid-2003, Cook+Fox Architects began designing the new Bank of America Tower at One Bryant Park. This 54 story, $1.3 billion commercial headquarters, developed jointly by the Bank of America and the Durst Organization, is currently under construction in Midtown Manhattan on 6th Avenue and 42nd Street, across the street from Bryant Park and the New York Public Library. When completed in 2008, it will be the 2nd tallest building in New York City, standing 945 feet to the top of its roof. The design provides an integrated approach to green building practices and technologies that focuses on creating the most high performance building possible: one that would use far less energy, far less water, create a high quality interior environment, use materials with high recycled content and no Volatile Organic Compounds (VOCs), recycle construction debris and utilize a high-performance construction team. As a result, it will be the first high-rise office tower in the country to achieve a LEED Platinum rating, the highest possible certification from the US Green Building Council.

The glass, steel and aluminum skyscraper is inspired by the famed Crystal Palace, the first glass and light-frame metal building in America, erected in Bryant Park in 1853. The faceted crystal design of the tower features unique sculptural surfaces with crisp folds and precise vertical lines that are animated by the movement of the sun and the moon. The transparency of the building, with its floor-to-ceiling windows, provides evocative views both from and through the space. The verticality of the 55-story building embraces the urban environment and the configuration of the base is designed to accommodate and enhance pedestrian and transportation circulation. With approximately three times the public circulation space required by an as-of-right high-rise office building, the Bank of America Tower will accommodate and contribute to the surrounding pedestrian and transit circulation. Public amenities will include widened sidewalks, public street furniture and a public urban garden room located at 43rd Street and Sixth Avenue, which serves as an inviting extension of Bryant Park.

The vision was to create a daylight-infused workplace and the most transparent possible connection between indoor and outdoor environments. Seeking to dissolve this boundary led to the choice of extremely clear, low-iron floor-to-ceiling glass, with a "low-e" coating and "frit" pattern for improved energy performance. Densely patterned near the floor and ceiling, this "frit" pattern of small ceramic dots – silkscreened directly onto the glass curtainwall – fades away to clear vision glass in the center 5' of each panel. While helping block heat gain to the interior, the frit lets the human eye make sense of the transparent plane and adds a feeling of security. The pattern also dapples light and shadow into the interior, recalling the experience of being outdoors. To reinforce the perception of safety, a railing at waist height was added.

A high-performance work environment addresses natural light, artificial lighting, thermal and acoustic comfort, air quality, and other design factors. The first priority for the Bank of America Tower was to design a daylit environment that would let tenants work by natural light as much as possible. Enclosed in highly transparent, 9'6" floor-to-ceiling glass, the workplace also provides a direct connection to the outdoors – a complex set of environmental cues whose impacts on human well-being are just starting to be understood by psychologists and designers, through a field known as *biophilia* – or human's innate kinship with the natural environment. Appropriately, glass partitions at the perimeters of the building allow all occupants to see outdoors.

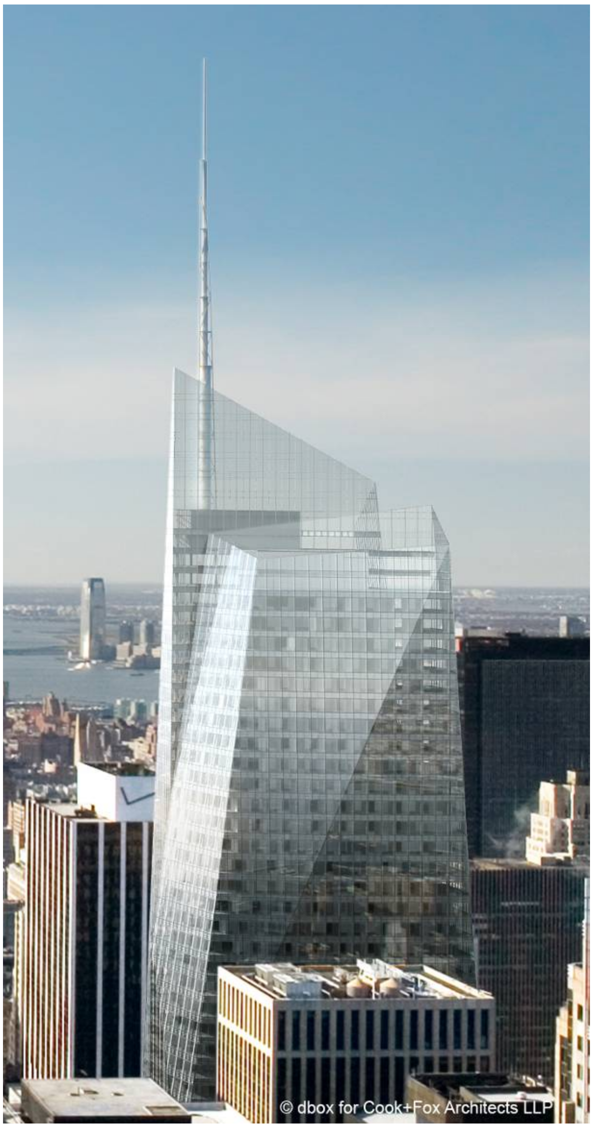

Figure 3. Bank of America Tower at One Bryant Park, © dDox for Cook+Fox Architects

In contrast to the sleek glass tower above, it was important for the lobby of One Bryant Park to touch the earth with solid, natural materials. Walls of pale Jerusalem stone, from which generations have constructed the dwelling-places of human civilization, are embedded with fossils from even more ancient life. Along the bank of elevators, the building's core of circulation activity, deep red leather paneling lines the walls. With thousands of people passing each day, human touch will add a patina to the leather, giving its color and texture a natural richness. Unlike materials that must be kept in pristine condition, leather actually becomes more beautiful with age and the weathering effect of repeated use.

The Bank of America Tower, with 2.2 million square feet of premium office space, will consume about half the energy and water of a typical building of its size, while creating the healthiest, most productive possible work environment for its occupants. It was designed to take advantage of a world-class public transit system: in getting to work, the tenants of the building will generate only 1/20th the energy of the average suburban commute. With 8000 workers arriving each day, the building will have zero parking spaces.

The Bank of America Tower will have an on-site, 4.6 megawatt natural gas fired power plant producing clean energy at 73 percent efficiency. Using cogeneration technology, this giant turbine will produce electricity, then use the waste heat to generate hot water for either heating the building in winter or cooling the building in summer with an absorption chiller. It will produce enough to supply approximately 67 percent of the building's annual energy needs.

Like most large cities, New York has an electric grid that struggles to keep up with demand during peak times. At these times, the power utility is forced to turn on its oldest, dirtiest "peaker" plants. It has been estimated that 90 percent of the air pollution in the city comes from just 50 percent of its power plants. One of the goals at the Bank of America Tower was to ensure the building did not contribute to this burden on the city's infrastructure. The building will have a thermal storage plant in the cellar, with 44 large Calmac tanks making ice at night, when energy demand is low and the cogeneration plant is producing more power than the building needs. During the day, the ice melts to supplement the air conditioning system, reducing the peak demand and creating a much more even level of power consumption. As in most cities, our local utility charges its customers a rate based on peak demand, so the building tenants will also save money by reducing peak consumption.

Potable water and wastewater are also critical issues impacted by the building sector. Like other major US cities, New York has a combined sewer and stormwater system. During significant rains, sewage treatment facilities routinely become overwhelmed by the volume of wastewater, and discharge partially treated sewage into our waterways. The Bank of America Tower, in contrast, will make almost no stormwater contribution to the municipal system. All "normal" stormwater will be collected; only extreme weather events will cause the building to contribute stormwater to the system. The building will do this by collecting the stormwater and snow that falls on its roofs, about four feet a year, as well as groundwater at a rate of 5,000 gallons per day, and storing it in 5 tanks staged throughout the building. Water that condenses from steam and air conditioning equipment and water from lavatory sinks will also be collected and treated. This greywater will be used to flush toilets and supply the cooling tower; in comparison nearly every office building in the US today uses clean, drinking-quality water for these purposes. The building has also installed waterless urinals, a technology that alone will save three million gallons of water every year. Thanks to these combined strategies, the building will consume less than half the potable water of a typical office building.

To the Bank of America, having the tower offer energy savings, drastically reduced greenhouse gas emissions, and add an iconic element to the New York City skyline was of great interest. But what really caught the Bank's attention was the quality of the indoor environment, and the potential impacts on employee health and productivity. Like other organizations, especially those in a knowledge-based industry, the Bank could expect to spend around 10 percent of its operating budget on rent and utilities, but more than 80 percent on salaries and benefits (Wilson, 2004). Even by rough calculations, a 1 percent increase in productivity – the equivalent of 5 minutes a day – would amount to $10 million a year. Fewer sick days and overall reduced absenteeism translate into real benefits for any organization. For the Bank, enhancing the ability to hire and retain the best talent was also extremely important.

According to the Environmental Protection Agency, indoor air can be more polluted than outside air, and most Americans spend 90 percent of their time indoors. Whereas the typical office building in New York filters out only 35 percent of particulates from the mechanical ventilation system, the Bank of America Tower will filter 95 percent of particulates, as well as ozone and VOCs. In effect, the air that is exhausted from the building will be much cleaner than the air coming in. In addition, in virtually all US office buildings, air is distributed through ducts in the ceiling plenum and then blown downward, where it mixes with all the air in a room, evenly distributing dust, germs, and allergens. Instead, the Bank of America Tower will have an under-floor air distribution system: rather than forcing conditioned air down from the ceiling, heat from occupants and computer equipment will utilize the First Law of Thermodynamics to draw fresh air upward. Individual air diffusers in the floor will allow all workers to adjust the flow of air around their desks, minimizing the circulation of airborne pathogens and resolving the chief complaint among office workers of being too hot or too cold.

Other issues that have been considered include the impacts of materials over their entire life-cycle, from cradle to grave. The manufacture of cement, for example, results in one ton of CO_2 emitted for every ton of cement produced. This is why worldwide, the cement industry is responsible for approximately 7 percent of all CO_2 emissions. To reduce these emissions, 45 percent of the cement in the Bank of America Tower has been replaced with blast furnace slag, a waste product of the steel industry. In addition to re-using an industrial waste product, we have calculated that this practice will prevent approximately 56,000 tons of CO_2 from entering the atmosphere. Other materials-related practices include preferred purchasing of products with high recycled content and locally-produced materials and the recycling of 83 percent of construction and demolition debris.

Where green building practices represented an additional cost, the costs and benefits were carefully evaluated by the team. Some ideas – such as photovoltaics and wind turbines – were abandoned; only strategies that represented a reasonable payback were pursued. In total, the added cost of green technologies and practices, including cogeneration, represents approximately 2 percent of the project budget. Building at such a scale helped to reduce the overall cost of high performance green measures.

Building in a fundamentally different way is a challenging task. Before an industry-wide standard was created, practitioners had to determine for themselves what practices were harmful or beneficial. As a standard developed by a coalition representing all sectors of the building industry, the US Green Building Council's LEED system is now a common language for measuring and validating green buildings. Every LEED certified building must comply with certain prerequisites, from eliminating Environmental Tobacco Smoke to commissioning all mechanical, electrical, and plumbing equipment to ensure it operates at the level at which it was designed to perform. This voluntary standard is designed to evolve over time, and results from a consensus-based process that is inherently robust and inclusive. Some 600,000 volunteer hours from architects, engineers, energy modelers and building managers have been invested in developing and improving LEED over the past 10 years. This level of collaboration is unmatched in any industry, and has helped accelerate the current transformation of green building.

Planning for the Future: PlaNYC 2030

The kind of thinking demonstrated in One Bryant Park is now being planned for New York City as a whole. In large cities like New York, green buildings are being recognized as an essential part of planning for future growth, maintaining the urban infrastructure, and protecting health and quality of life. With urban populations growing rapidly, cities across the US face great challenges, but can also benefit from urban density.

In October of 2005, New York City Mayor Michael Bloomberg began to build up momentum by signing Local Law 86, which now requires New York City's municipally owned or funded projects to achieve a minimum LEED rating – Certified or Silver depending on the building type – and use energy and water more efficiently than current codes require. In 2006, a Sustainability Advisory Board composed of technical and policy experts was formed to advise the City on environmentally-sound policies and practices in conjunction with the creation of Mayor Bloomberg's Office of Long-Term Planning and Sustainability. Representing the architecture profession, Cook+Fox was asked to serve on this Advisory Board dedicated to looking at issues such as zoning, stormwater management, building energy, water efficiency, and green roofs.

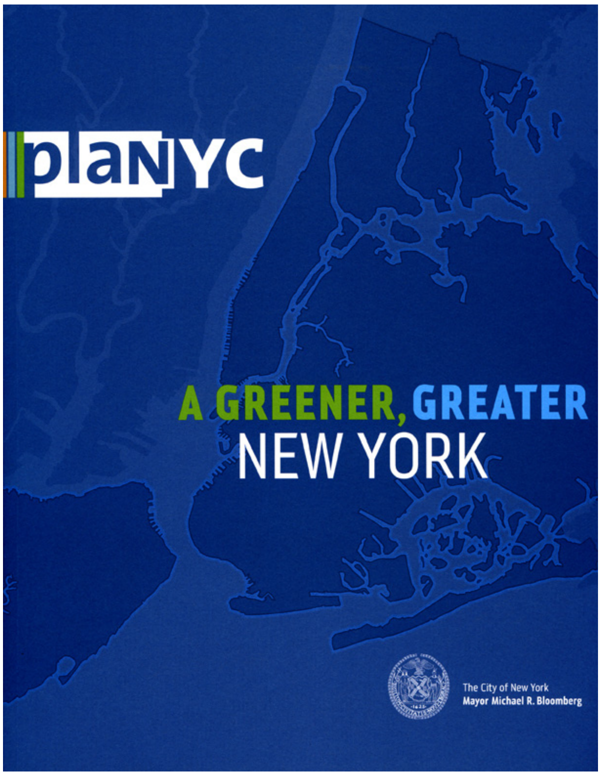

Figure 4. PlanNYC: A Greener, Greater New York, © The City of New York

In its first six months, the committee's work entailed prioritizing issues for the new sustainability agenda, setting near- and long-term sustainability targets for City government, and creating comprehensive strategies for achieving those goals. Among its specific projects, the committee advised the Office of Long-Term Planning and Sustainability on undertaking a major greenhouse gas inventory for both municipal operations and the City as a whole, which will help to set priorities for policy development.

As part of this ambitious planning initiative, "PlaNYC: A Greener, Greater New York" was released in April 2007. PlanNYC provided a comprehensive agenda for sustainable growth over the next 30 years and summarized the City's sustainability agenda for nine interrelated areas – housing, open space, brownfields, water quality, water network, congestion, state of good repair, energy, air quality – and the larger issues of climate change.

An important aspect of this study was the realization that existing buildings are an extremely important part of the energy equation. In New York City, it is estimated that by 2030, 85 percent of the city's energy usage will come from buildings that exist today. Existing buildings can be upgraded through lighting retrofits and improved heating and cooling systems; the resulting energy savings typically amount to a three to seven year payback. Retro-commissioning to optimize mechanical equipment functioning typically pays for itself within two to three years.

Since the release of "PlaNYC," the Sustainability Advisory Board has refocused its efforts to ensure that the City's strategies for sustainability are implemented in full and remain publicly accountable to citizens' concerns. New York City's active pursuit of sustainable development goals places it in the ranks of other leading municipalities around the world that are committed to addressing climate change and protecting the welfare of future generations of citizens.

Conclusion

In the pursuit of doing good for the environment, let me conclude with Provocation #5: Sustainability is not a limitation on design, but an inspiration. Organic in nature and restorative in function, sustainable architecture *can* be beautiful. Buildings, no matter how sustainable they are, still have to look good. In the end, architecture lives and dies on its ability to make people feel good and relate to its surrounding environment in an interesting way. Architects are beginning to embrace this challenge – evidenced by the many award-winning, LEED certified buildings being erected today. Our challenge then, is to create architecture that combines all of these ideals: providing interesting form and thoughtful proportion, relating to the site and its historic past, improving the surrounding social fabric, and designing a building that gives back to the world as much as it takes. If anyone has the opportunity to realize these goals… we do.

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