Planning for Countering Climate Change: Lessons from the Recent Plan of New York City - PlaNYC 2030

Introduction

In recent years, we have become increasingly aware of the environmental degradation and huge risks and uncertainties that climate change poses to our cities and communities (IPCC 2007, 719). Climate change is likely to affect the social, economic, ecological, and physical systems of any given city. It is supposed to bring higher temperatures, more intense rainstorms, droughts and heat waves, increased strains on materials and equipment, higher peak electricity loads and voltage fluctuations, transport disruptions, and increased need for emergency management. Ironically, cities themselves, through their economic production and modes of consumption, are major contributors to the environmental crisis. Apparently, cities and city planning have an important role to play in contending with the future impact of climate change, which, with its many complexities and uncertainties, poses new challenges for the planning profession. For this reason, generating a broad understanding of planning's role in fighting climate change is now emerging as a crucial task for planners, who are still in the preliminary stages of setting agendas and exploring possible directions (Kern and Alber 2008; Priemus and Rietveld 2009; van Leeuwen et al. 2009; Swart et al. 2009). Swart et al. (2009, 152) argue that although spatial planning is considered to be an essential lever of adaptation policy, "the references made to planning instruments widely remains very generic and vague" and "the specific potential of planning tools is, therefore, not yet addressed." Moreover, even though planners and planning have the "ability to think the big, long-term thoughts about the interrelatedness and interdependency" of complex issues such as hazard mitigation and climate change (Schwab 2010, 5), many cities around the world, including the most pioneering among them, still fail to utilize comprehensive and spatial planning in their fight against climate change (Kern and Alber 2008).

A review of recent urban plans aimed at countering climate change highlights three types of planning practices. The first, which has been used by a large number of cities, is the use of *mitigation* policies aimed at GHG emission reduction. The second has been used by a smaller number of cities, and involves the use of *adaptation* policies, in addition to *mitigation* policies, to contend with risks posed by climate change. The third, which has emerged more recently and has been used by only a handful of cities, promotes a more inclusive planning practice based on *mitigation* and *adaptation* policies, in addition to further integration of spatial, social, and economic policies. The ultimate outcome of this third type of practice is the construction of a new emerging approach to planning which I refer to here as *Planning for Countering Climate Change (PCCC).*

This paper explores and characterizes the emerging approach of PCCC and offers a thorough assessment of its advantages. More specifically, it examines the tools and procedures utilized by PCCC, as well as the role of *climate change* in shaping the planning process and its various components, beginning with problem formulation and culminating in its many outcomes.

New York City is one of the few cities in the United States and the world to employ such practices. This paper will analyze and gain new insight from the City's recent plan, *PlaNYC 2030*, which employs a PCCC approach to city planning.

Research Methods

This paper examines the role and influence of *climate change* through an analysis of the main components of the planning process, which include: formulation of the plan's problem statement, vision, and goals; its procedure and planning approach; its scope and the issues it considers; and its final outcomes. By considering questions related to the importance of climate change for each component, this paper provides us with a sound understanding of the role of climate change in city planning and the advantages of PCCC in the effort to counter climate change. The components analyzed and the questions asked are as follows:

1. *Problem Statement*: Overall, the goal of the problem statement is to justify the planning mission and present supporting evidence to convey a basic understanding of the nature and extent of the problems facing the city. What role does climate change play in the main problems addressed by the plan, and how is this role reflected in the problem statement?
2. *Visioning and Goal Setting*: What role does climate change play in the planning vision and goals of the plan?
3. *Procedure*: How was the plan generated? Who participated in the process? What was the nature of public participation?
4. *Approach*: What applied planning approaches (new urbanism, sustainable development, etc.) were utilized during the planning process?
5. *Scope of Issues*: What issues does the plan address? Does it focus only on environmental aspects and GHG emission reeducation, or does it also address relevant social and economic issues?
6. *Outcomes*: What is the nature and scope of the various final products of the planning process? Do these components focus primarily on mitigation and adaptation policies? Do they also incorporate social and economic policies and initiatives?

For the purpose of this study, we reviewed *PlaNYC: A Greener, Greater New York*, and several other related documents published by the city of New York, including: *PlaNYC: Progress Report 2009*; *Climate Change Report* (2009); *Energy Conservation Plan* (2008); *Greenhouse Gas Inventory* (2008); *Municipal Energy Conservation* (2008); *Think Locally, Act Globally: How Curbing Global Warming can Improve Local Public Health (2008)*; *PlaNYC: Inventory of New York City Greenhouse Gas Emission*. (2009); and *NPCC - New York City Panel on Climate Change*: *Climate Risk Information* (2009).

Problems Statement

Climate change played a major role in formulating the problems facing New York City and justifying the urgency of the new plan. A fundamental assumption of PlaNYC, which was launched on Earth Day 2007, is that "climate change poses real and significant risks to New York City" (*PlaNYC: Progress Report 2009*, 39). Both PlaNYC and the NYC Panel on Climate Change (NPCC 2009), a public body

proposed by PlaNYC and convened by the mayor of New York in 2008, portrays New York as a city at risk.

The NPCC holds that "climate change poses a range of hazards to New York City and its infrastructure" and that "these changes suggest a need for the City to rethink the way it operates and adapts to its evolving environment" (NPCC 2009, 3). Climate change is likely to bring warmer temperatures to New York City and the surrounding region, as the mean annual temperatures projected by global climate models are expected to increase by 1.5- 3 degrees (Fahrenheit) by the 2020s, 3-5 degrees by the 2050s, and 4-7.5 degrees by the 2080s (NPCC 2009). The city will also experience more intense rainstorms, while annual precipitation is likely to increase and droughts are likely to become more severe toward the end of 21st century. Heat waves are also expected to become more frequent, intense, and longer in duration, and sea levels are likely to rise, with increase of 2-5 inches by the 2020s, 7-12 inches by the 2050s, and 12-23 inches by the 2080s. In contrast to the period preceding the industrial revolution when sea levels rose at rates of 0.34 to 0.43 inches per decade, current rates of increase around New York City range from 0.86 and 1.5 inches per decade (NPCC 2009, 5-9; Gehrels, et al. 2005; Holgate and Woodworth 2004). As a result, general flooding and storm-related coastal flooding are likely to increase as well (NPCC 2009, 4). New York City has almost 578 miles of coastline and over half a million residents living within the current flood plain, and this poses a particularly dangerous risk to the city. At the current sea level, NPCC holds that New York City already faces the probability of a "hundred year flood" once every 80 years. This could increase to once every 43 years by the 2020s and to once every 19 years by the 2050s. According to one estimate, a Category 2 hurricane would inflict more damage on New York than on any other American city except Miami (NPCC 2009, 8).

As a result, climate change poses particular threats to New York's infrastructure, including: increased summertime strain on materials; higher peak electricity loads in summer and reductions in heating capacity in winter; voltage fluctuations, equipment damage and service interruptions; increased demands on HVAC systems; transportation service disruption; increased street, basement and sewer flooding; reduction of water quality; inundation of low-lying areas and wetlands; increased structural damage and impaired operations; and increased need for emergency management procedures (NPCC 2009, 4-30).

In addition to these threats, the already deteriorating physical condition of the City's infrastructure adds dramatically to the uncertainties surrounding climate change. According to PlaNYC (2007, 7), the City's infrastructure "is the oldest in America." Not only are the subway system and highway networks heavily-used, but about 3,000 miles of roads, bridges, and tunnels are in need of repair, as are many subway stations. To make matters worse, the water infrastructure has not been inspected in more than 70 years, and 52% of the city's tributaries that run adjacent to the shoreline and pass through neighborhoods are unsafe even for boating. Finally, about 7,600 acres throughout the boroughs remain contaminated, and the city suffers from one of the worst asthma rates in the country (PlaNYC, 7). Between the years 2000 and 2005, New York's greenhouse gas emissions increased by almost 5% (PlaNYC, 135), which is of particular significance because New York City emits

nearly 0.25% of the world's total greenhouse gases. As a coastal city, PlaNYC concludes, "we are vulnerable to the most dramatic effects of global warming: rising sea levels and intensifying storms" (PlaNYC, 133).

In this way, climate change and its effects play a decisive role in the manner in which PlaNYC describes the problems currently facing the city, which may lead to a dramatic deterioration of life in the city in the future.

Visioning and Goal Setting

Climate change is central to the visioning of New York City according to PlaNYC. PlaNYC begins by *diagnosing* the local and global climate change crisis as problematic and critical for NYC and the world as a whole. The plan portrays New York as the most sustainable and "one of the most environmentally efficient cities" in the United States (PlaNYC, 135), producing "less than a third of the CO2e generated by the average American." In this way, it explains, "Growing New York is, itself, a climate change strategy." According to the Plan, New York City is a globally responsible, pioneering, modern and innovative city – a city with an "unending sense of possibility" (PlaNYC, 130). Still, PlaNYC acknowledges, "in spite of our inherent efficiency, we can do better. And we must. Instead we are doing worse" (PlaNYC, 135). As one of the world's most spectacular cities, planners hold, New York should seize the opportunity and "define the role of cities in the 21st century and lead the fight against global warming" (PlaNYC, 130). The City "cannot afford to wait until others take the lead" on curbing climate change. "New York has always pioneered answers to some of the most pressing problems of the modern age," the planners argue, and "it is incumbent on us to do so again, and rise to the definitive challenge of the 21st century" (PlaNYC, 9).

PlaNYC's vision generates a sense of local and global *urgency*: "unless the public…appreciate[s] the urgency," it warns, "…we will not meet our goal" (PlaNYC, 110). "Meanwhile, we will face an increasingly precarious environment and the growing danger of climate change that imperils not just our city, but the planet. We have offered a different vision… It is a vision of New York as the first sustainable 21st century city— but it is more than that. It is a plan to get there" (PlaNYC, 141).

PlaNYC promises a *better future*: "The result, we believe, is the most sweeping plan to strengthen New York's urban environment in the city's modern history… we have developed a plan that can become a model for cities in the 21st century" (PlaNYC, 10).

> "It is a vision of providing New Yorkers with the cleanest air of any big city in the nation; of maintaining the purity of our drinking water;…; of producing more energy more cleanly and more reliably, and offering more choices on how to travel quickly and efficiently across our city. It is a vision where contaminated land is reclaimed and restored to communities; where every family lives near a park or playground; where housing is sustainable and available to New Yorkers from every background, reflecting the diversity that has defined our city for centuries" (PlaNYC, 141).

PlaNYC casts "climate change," or "sustainability," as a major concern and central theme of the plan. New York City Mayor Michael Bloomberg describes PlaNYC as "a long-term vision for a sustainable New York City" which "has been acknowledged around the world as one of the most ambitious – and most pragmatic – sustainability plans anywhere" (*PlaNYC: Progress Report 2009*, 4). He also maintains that each of the plan's 127 initiatives "will not only strengthen our economic foundation and improve our quality of life; collectively, they will also form a frontal assault on the biggest challenge of all: global climate change" (*PlaNYC: Progress Report 2009*, 2).

The vision advanced in PlaNYC includes solutions and planning strategies, calls for collective action, and promises that "We can do better. Together, we can create a greener, greater New York" (PlaNYC, 3). In the words of the mayor, "Truly, PlaNYC has become a citywide effort…we are creating a better and more sustainable city – one that will rise above the current economic turmoil and show the world how it is possible to come back stronger than ever… The City is committed to these goals, and together, I know we can build a greener, greater New York" (*PlaNYC: Progress Report 2009, 4).*

The vision of PlaNYC is ambitious: its practical aim is to reduce emissions by 30%, and its physical agenda is to develop NYC as a "greener, greater New York." The vision adequately addresses local and global climate change as a central concern of planning and future development. It aims to inspire and mobilize New Yorkers to collectively adhere to the planning initiatives and to build consensus and legitimacy for its implementation. For this reason, the word '*we*' appears 1,708 times in the 156 pages of PlaNYC, or about 11 times per page. At the same time, however, the vision overlooks the city's rich social and cultural agenda, which stems from its diversity. Strikingly, even though New York is "more diverse than ever; today nearly 60% of New Yorkers are either foreign-born or the children of immigrants" (PlaNYC, 4) - with 174 languages spoken by the city residents - the vision neglects the social and cultural issues that are relevant to this majority of the city's population.

PlaNYC classifies its main goals under six main themes, as shown in Table 1. All of the plan's main themes, and nine of its ten goals, are physically and environmentally oriented, while only one goal, which focuses on housing and affordability, can be considered social in nature. In this way, climate change clearly plays a key role in the vision of the City and maintains a strong implicit and explicit presence within the plan's goals.

Table 1. Goals of PlaNYC

Main Theme	Sub-Theme	Goals
Land	Housing	*"Create homes for almost a million more New Yorkers, while making housing more affordable and sustainable."*
	Open Space	*"Ensure that all New Yorkers live within a 10-minutes walk of a park."*
	Brownfields	*"Clean up all contaminated land in NYC."*
Water	Water Quality	*"Open 90% of our waterways to recreation by preserving natural areas and reducing pollution."*
	Water Network	*"Develop critical backup systems for our aging water network to ensure long-term reliability."*
Transportation	Congestion	*"Improve travel times by adding transit capacity for millions more residents, visitors, and workers."*
	State of Good Repair	*"Reach a full 'state of good repair' on NYC's roads, subways, and rails for the first time in history."*
Energy	Energy	*"Provide cleaner, more reliable power for every New Yorker by upgrading our energy infrastructure."*
Air	Air Quality	*"Achieve the cleanest air quality of any big U.S. city."*
Climate Change	Climate Change	*"Reduce global warming emission by 30%."*

Source: Based on information contained in *PlaNYC*, pp. 15, 51, 73, 99, 117, 131.

Procedure

Despite the significant planning it embodies and the crucial dilemmas it raises, PlaNYC the mechanism and procedures it proposes for facilitating citizen participation in the planning process are wholly inadequate. PlaNYC asks: "What kind of city should we become?" and asserts: "We posed that question to New York" (PlaNYC, 9). However, instead of a systematic procedure for public participation, the planners employed participation methods that were disorganized at best:

> "Over the past three months, we have received thousands of ideas sent by email through our website; we've heard from over a thousand citizens, community leaders and advocates who came to our meetings to express their opinions; we have met with over 100 advocates and community organizations, held 11 Town Hall meetings, and delivered presentations around the city. The input we received suggested new ideas for consideration, shaped our thinking, reordered our priorities" (PlaNYC, 9).

Notwithstanding this process, it is clear that public participation in the process was inadequate and insufficient for meeting the planning challenges stemming from climate change for one of the world's most socially and culturally

diverse cities. PlaNYC poses important urban dilemmas but does little to elicit real community participation. Instead, the planners appear to provide the answers themselves, in the name of New Yorkers: "By moving ahead, we will continue to ensure that the essential character of the city's communities remains intact as we seek out …opportunities for public rezonings" (PlaNYC, 21).

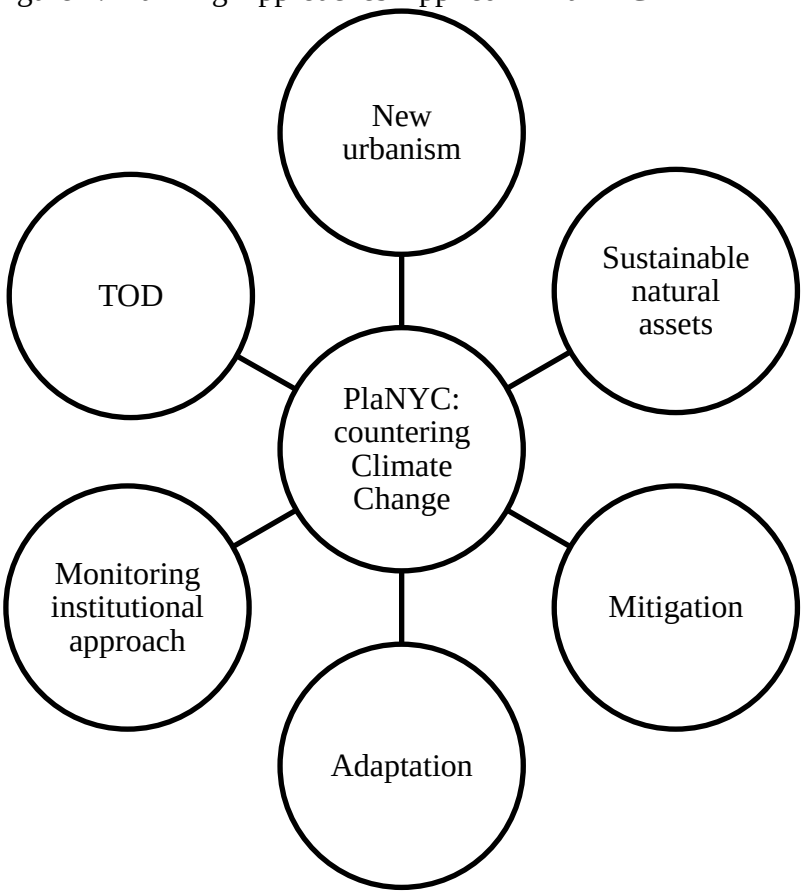
PlaNYC encourages community involvement in significant planning issues *in the future* and reflects little interest in community involvement during the preparation of the plan itself. In this spirit, it suggests *future engagement* in developing adaptation strategies, mainly by working "with vulnerable neighborhoods to develop site-specific strategies," and to "create a community planning process to engage all stakeholders in community-specific climate adaptation strategies" (PlaNYC, 138). PlaNYC also suggests working with communities while exploring potential sites for development in their communities (PlaNYC, 25), and in the rezoning of brownfields (PlaNYC: 44). Tom Angotti (2008) criticizes PlaNYC's community participation and suggests that instead of carrying out a single discussion with each of the 59 Community Boards the plan "could challenge each community to come up with its own priorities for long-term sustainability, affordable housing creation, open space, and transportation. Let the communities speak."

Planning Approach

PlaNYC is an inclusive plan for a big city. Its current population is approximately 8,363,700 (US Census Bureau 2009), and its target population for 2030 will surge past nine million (PlaNYC, 6). By the same year, the work force will grow by 750,000 jobs, there will be a need for 60 million square feet of additional commercial space (PlaNYC, 6), and the number of annual visitors to the city will reach 65 million. These additional jobs, tourists, and residents are expected to "generate an additional $13 billion annually" (PlaNYC, 6).

After careful analysis, this paper concludes that PlaNYC makes advantageous use of various planning approaches, particularly new urbanism, TOD (transit-oriented development), sustainable natural capital, mitigation policies, adaptation policies, and *institutional monitoring* approach. Together, these approaches contribute to current efforts to plan with an eye toward countering climate change in New York City. Their primary thrusts and the roles they played in the planning process can be understood as follows:

Figure 1. Planning Approaches Applied in PlaNYC



1. Sustainable Natural Assets: The concept of maintaining constant natural capital is an important criterion for sustainability. Natural capital should be kept constant over time in order to ensure that future generations will be able to generate wealth and well-being without harming the ecological system (Pearce and Turner 1990). PlaNYC focuses on three aspects of natural capital assets: air, water, and land. Its major strategy is asset restoration . To this end, PlaNYC takes the following measures:

(a) *Air:* The plan promotes initiatives to improve air quality and reduce emissions by 30% (PlaNYC, 116). If no action is taken, New York City's carbon emissions will grow to almost 74 million metric tons by 2030 (PlaNYC, 9).

(b) *Water*: The Plan calls for developing critical backup systems for the City's aging water network to ensure long-term reliability, and proposes ways of maximizing urban water absorption when planting trees (PlaNYC, 12, 59). It also proposes the creation of vegetated ditches (swales) along parkways to store direct rainfall and facilitate the natural cleansing of runoff (PlaNYC, 60).

(c) *Waterfronts and Waterways:* New York City has 578 miles of waterfront, which the Plan regards as "one of the city's greatest opportunities for residential development" and as an important site of other types of projects as well (PlaNYC, 22). PlaNYC also confronts the "legacy of the City's industrial past…" "…which treated New York's waterways as a delivery system" (PlaNYC, 51), and proposes the

opening of 90% of the City's waterways to recreation by preserving natural areas and reducing pollution (PlaNYC, 53).
(d) *Trees:* The plan suggests reforesting approximately 2,000 acres of parkland throughout the city by 2017 (PlaNYC, 128).
(e) *Land:* PlaNYC calls for more efficient use of the City's existing stock of land and for the reclamation of the vast majority of vacant, unutilized, and under-used land for development.
2. New Urbanism: PlaNYC actively promotes some of the main tools of new urbanism, including:
a) *Compactness*: The current overall population density in New York City is 25,383 persons per square mile, and the highest density in the city is 128,600 (New York City 2009). Today, less than 4% of the City's buildings account for roughly 50% of the city's built area (PlaNYC, 102). PlaNYC proposes a number of planning strategies to increase compactness within the City. It suggests *infill* "everywhere it is possible" and development of spaces that "are now lightly used," such as parking lots in public housing areas that were developed in the 1930s (PlaNYC, 23). It also calls for developing underutilized areas throughout the city that are well-served by public transportation and other infrastructure; for capturing the potential of transportation infrastructure investments; and for decking over rail yards, rail lines, and highways (PlaNYC, 19-25). Through *rezoning*, PlaNYC aims to continue directing growth toward areas with strong transit access; reclaiming underused or inaccessible areas of waterfront; and exploring opportunities to spur growth through the addition of mass transit (PlaNYC, 21). PlaNYC fosters rezoning and redevelopment of brownfields, which according to the Plan represent one of the City's greatest opportunities and cover some 7,600 acres throughout the five boroughs (PlaNYC, 41).
b) *Mixed Land Use*: PlaNYC encourages mixed land use in future development, mainly by mixing transportation use with residential areas and open spaces. It encourages co-location of the 43,000 acres of city-owned land with other uses. Most of this land is slated to be developed for government operations, "but significant opportunities exist for housing to co-exist with the current use—from libraries to schools to parking lots" (PlaNYC, 22).
c) *Renewal and Utilization*: PlaNYC proposes adapting unused schools, hospitals, and other outdated municipal sites for productive use as new housing (PlaNYC, 23). It also calls for cleaning and utilizing up to 7,600 acres of contaminated brownfields across the city and suggests strategies to "make existing brownfield programs faster and more efficient; to create remediation guidelines for New York City cleanups; and to establish a City office to promote brownfield planning and redevelopment" (PlaNYC, 41-44).
d) *Greening*: In NYC today, the average area of park area per thousand residents is 1.5 acres, and there is an average of one playground for every 1,250 children. Furthermore, in 97 out of the City's 188 neighbourhoods, the number of children per playground is even higher (PlaNYC, 30). In this context, PlaNYC adopts greening as a major strategy and proposes three primary ways to ensure that by 2030, nearly every New Yorker will live no more than a 10-minute walk from a park: 1) by upgrading land already designated as play space or parkland and making it available to new populations; 2) by expanding usable hours at current, high-quality sites; and

3) by re-conceptualizing streets and sidewalks as public spaces. The combined impact of these policies will be the creation of over 800 acres of upgraded parkland and open space across the city (PlaNYC, 31). PlaNYC also calls for beautifying the public realm and undertaking "an aggressive campaign to plant trees wherever possible, in order to fully capitalize on tree opportunities across the city" (PlaNYC, 38). In addition, it proposes the expansion of "Greenstreets" and the transformation of thousands of acres of unused road space into green space. It also suggests offering incentives for green roofs, which can reduce runoff volume and aid other natural process by absorbing and/or storing water (PlaNYC, 60). Since the launch of PlaNYC, 200,000 trees have been planted across the five boroughs (*PlaNYC: Progress Report 2009*, 3).

3. Transit-Oriented Development (TOD): PlaNYC pursues TOD and uses rezoning to direct growth toward areas with strong transit access (PlaNYC, 21). As a result of these policies, New Yorkers will experience more comfortable travel, reduced travel times, and greater reliability, thus achieving a new standard of mobility (PlaNYC, 97). Nonetheless, the city's transportation systems are currently in poor condition. More than half of the city's subway stations are in need of repairs, and the city is more than $15 billion short of what it would cost to get the transit and road networks back into good shape. Trains are crowded, half of the City's subway routes experience congestion, and a large number of New Yorkers have no access to mass transit (PlaNYC, 76). PlaNYC proposes a "sweeping transportation plan" to enable the city to meet its needs through 2030 and beyond. The plan suggests improvement and expansion of the transit network; improvement of bus service; expansion of the ferry system; completion of a master bike plan; reduction of the gridlock on the roads which has become an increasing problem, through better road management and congestion pricing.

4. Institutional Monitoring approach: PlaNYC addresses the future uncertainties of climate change on a general level and proposes primarily institutional measures - the establishment of the NPCC and the Climate Change Advisory Board – to address them. PlaNYC advances an ambitious agenda of measures to "create a sustainable New York City" that "will require tremendous effort: on the part of City officials and State legislators; by community leaders and our delegation in Washington; from the State government and from every New Yorker" (PlaNYC, 140). Nonetheless, planners acknowledge that "the existing organizations, programs, and processes are inadequate to implement these policies" and "no organization is currently empowered to develop a broad vision for energy planning in the city that considers supply and demand together as part of an integrated strategy" (PlaNYC, 104). On this basis, the plan concludes that "there is a clear need for a more comprehensive, coordinated, and aggressive planning effort, focused on the specific needs of New York City," and calls for the establishment of the New York City Energy Planning Board (PlaNYC, 105). It also calls for "changes at the City, State, and Federal levels - for transportation funding, for energy reform, for a national or state greenhouse gas policy" (PlaNYC, 11), and for "creating a new regional financing entity, the SMART Financing Authority, that will rely on three funding streams: the revenues from

congestion pricing and an unprecedented commitment from New York City that we will ask New York State to match" (PlaNYC, 13). In addition, it suggests establishing a City office to promote brownfield planning and redevelopment (PlaNYC, 45). In the ways mentioned above, PlaNYC promotes an integrative approach to the issue of climate change on the formal institutional level. Nevertheless, it fails to effectively integrate civil society and grassroots organizations, such as the 59 Community Districts and the Boards of New York City, into the effort.

5. Adaptation Policies: PlaNYC assumes that "there is no silver bullet to deal with climate change," and that "as a result, our strategy to help stem climate change is the sum of all the initiatives in this plan" (PlaNYC, 135). The Plan's main thrust for climate change adaptation appears to lie in the creation of "an intergovernmental Task Force to protect our city's vital infrastructure" and "to work with vulnerable neighborhoods to develop site-specific strategies" (PlaNYC, 136). In addition, PlaNYC proposes the establishment of a New York City Climate Change Advisory Board and a citywide strategic planning process "to determine the impacts of climate change to public health and other elements of the City and begin identifying viable adaptation strategies" (*PlaNYC: Progress Report 2009*, 39). Proposed adaptation policies also include measures to fortify the city's critical infrastructure, to be implemented through close cooperation among city, state, and federal agencies and authorities; updating the flood plain maps to better protect areas that are most vulnerable to flooding; and working with at-risk neighborhoods across the city to develop site specific plans. "In addition to these targeted initiatives," the Plan reads, "we must also embrace a broader perspective, tracking the emerging data on climate change and its potential impacts on our city" (PlaNYC, 136).

6. Mitigation of GHG Emission: PlaNYC promotes initiatives to improve air quality and reduce emission by 30% by 2030 (PlaNYC, 116). Moreover in order to maximize energy efficiency, PlaNYC calls for focusing this effort on buildings, the city's largest energy consumers (PlaNYC: 107). Over two thirds of the city's energy is consumed within buildings, compared to a national average of less than one third. According to the Plan, "the City has 5.2 billion square feet of space parceled into almost one million buildings" (PlaNYC, 107-108). By 2030, at least 85% of the city's energy will be used by buildings that already exist today. In this way, energy saving measures in existing buildings will result in a seven million ton reduction in global warming emissions. This is significant, for without the measures outlined in the Plan, emissions would rise to almost 80 million metric tons by 2030 (*PlaNYC: Progress Report 2009*, 39). In addition, the plan proposes an extensive education and training campaign in the realm of energy awareness (PlaNYC, 110). The most effective strategy, the Plan asserts, is to reduce the number of vehicles on the road and to simultaneously expand the city transit system and implement congestion pricing (PlaNYC, 136). According to planners, approximately 50% of reductions in CO2 emissions will come from increased energy efficiency in buildings, while 32% will result from improved power generation and 18% from changes in transportation. Planners explain their decision to not rely on "the widespread *use of solar energy in this* plan because its costs today are too high for general use" (PlaNYC, 136). PlaNYC suggests "greening" the Building Code of New York, and proposes focusing

on the reduction of the amount of cement used in concrete, as cement production is an energy-intensive process that releases one ton of C02 for every ton of cement produced (PlaNYC, 106-7).

Scope and Issues

Overall, PlaNYC focuses primarily on physical planning dimensions and less on socio-cultural issues. The vision, goals, strategies, and outcomes of PlaNYC are organized around six physical and environmental themes: land, water, transportation, energy, air, and climate change, none of which are socially or culturally oriented. Practically none of the major thrusts of the plan deal directly with issues of equity and justice, such as diversity, the future of communities and neighborhoods, the cultural diversity of the city and its immigrants, and poverty--a term which appears only once in the entire plan.

Energy in general and *ecological economy* in particular is a central theme of PlaNYC toward the achievement of its climate change objectives. According to the plan, improving the city's energy infrastructure and lowering demand will reduce energy costs by billions of dollars over the next decade; watershed protection will make multi-billion-dollar investments in new water filtration plants unnecessary; and improving public transportation and reducing congestion will reduce the economy's annual $13 billion loss due to traffic delays **(**PlaNYC, 133). By managing demand, increasing the energy supply, and saving energy in existing buildings, the city's overall power and heating bill will plunge by $2-4 billion, resulting in an estimated annual savings of approximately $230 for the average household by 2015. Congestion pricing is projected to generate net revenues of $380 million in the first year of operation, increasing to over $900 million by 2030 (PlaNYC, 96). To this end, PlaNYC proposes an amendment to the City Charter requiring that New York City invest an amount equal to 10% of its energy expenses in energy-saving measures each year. Planners also note that the measures required to execute these initiatives "will create thousands of well-paying jobs" **(**PlaNYC, 133), and that this will mean that the city will have "not only a healthier environment, but also a stronger economy" (PlaNYC, 13). In these ways, PlaNYC provides a number of economic engines to promote climate change objectives and a cleaner environment. Its well based conclusion is that "adapting to climate change and investing in mitigation not only ensures the city's long-term economic vitality, but it will encourage public and private investments in the city's infrastructure, support green jobs, and improve the quality of life and level of service enjoyed by New Yorkers today." (*PlaNYC: Progress Report 2009*, 38).

Affordable housing appears to be one of the only social themes that PlaNYC seeks to address. "The most pressing issue we face today is affordability," planners write. "Between 2002 and 2005 the number of apartments affordable to low-and moderate-income New Yorkers shrank by 205,000 units" (PlaNYC, 18). The Plan assumes that "if supply is not created as fast as people arrive, affordability could suffer further" (PlaNYC, 18). On this basis, it calls for expanding the housing "supply potential by 300,000 to 500,000 units to drive down the price of land" and for pairing "these actions with targeted affordability strategies like creative financing, expanding the use of inclusionary zoning, and developing homeownership

programs for low-income New Yorkers." This, planners hold, will "ensure that new housing production matches our vision of New York as a city of opportunity for all" (PlaNYC, 12). However, in practice, PlaNYC proposes the provision of 500,000 housing units without advancing effective policies for ensuring affordable housing and regaining the more than 200,000 units that have already been lost.

Although PlaNYC notes the existence of *environmental injustice* in the city, it fails to address the issue in a serious manner and takes no practical measures to mitigate the phenomenon. For example, planners acknowledge that most brownfields are concentrated in low-income communities, resulting in a case of severe environmental injustice (PlaNYC, 41). The owners of such land "often find that their financial interests dictate development plans that minimize cleanup requirements" and "may choose new uses for the land" that "do not reflect community needs or desires" (PlaNYC, 42-42). Moreover, "in some communities, the impacts of exposure to local air emissions have likely contributed to higher asthma rates and other diseases" (PlaNYC: 119). These clear cases of environmental injustices also go unaddressed by the plan.

Moreover, NYC is a diverse city with 5 boroughs, 59 community districts and hundreds of neighborhoods. PlaNYC acknowledges that shifting climate patterns will have a wide range of affects on these communities, taking lives and posing "major public health dangers," and impacting the property and livelihood of many (PlaNYC, 138). All five NYC boroughs "have vulnerable coastline." Moreover, the massive growth proposed by PlaNYC will certainly affect these communities, and may even "erase the character of communities across the city" (PlaNYC, 18). In considering the spatial impact of implementing the plan, planners raise a crucial dilemma for the future of New York City and its communities:

> "We cannot simply create as much capacity as possible; we must carefully consider the kind of city we want to become. We must ask which neighborhoods would suffer from the additional density and which ones would mature with an infusion of people, jobs, stores and transit. We must weigh the consequences of carbon emissions, air quality, and energy efficiency when we decide the patterns that will shape our city over the coming decades" (PlaNYC, 18).

Moreover, PlaNYC fails to address the climate change vulnerability, i.e., how climate change could affect each neighborhood, with an emphasis on the specific environmental risks that exist in each neighborhood and that each neighborhood is likely to face in the future.

On a practical level, PlaNYC neglects issues of *socioeconomic* and *cultural diversity*, including crucial socio-spatial issues such as segregation. It also fails to promote a wider variety of housing types. At the same time, however, PlaNYC recognizes that "the mixture of residents will determine, more than anything else, the kind of city we become," and that "by expanding supply possibilities to create healthier market conditions, we can continue ensuring that new housing production matches our vision of New York as a city of opportunity for all." "If New York loses its socioeconomic diversity," planners warn, "its greatest asset will be lost. We can—and must—do better" (PlaNYC, 27).

Outcome

The major planning outcomes are 127 new initiatives that aim, according to PlaNYC, to strengthen the economy, public health, and the quality of life in the city. Collectively, they will form the broadest attack on climate change ever undertaken by an American city. In addition, "most of *PlaNYC's* 127 separate initiatives contribute *directly to achieving the ci*ty's GHG reduction goals: to reduce citywide GHG emissions by 30 percent by 2030 and to reduce City government GHG emissions by 30 percent by 2017" (*PlaNYC: Inventory of New York City Greenhouse Gas Emission, 2009*). Each initiative is meant to achieve multiple goals and at the same time to contribute to the global fight against climate change. Their goals can be classified according to six themes: land, water, transportation, energy, air, and climate change (PlaNYC, 142-145).

In addition to these initiatives, the Plan proposes the establishment of new Planning and Monitoring Boards in order to achieve a more comprehensive, coordinated, and aggressive planning effort, focused on the specific needs of New York City (PlaNYC, 105). It also calls for "changes at the City, State, and Federal levels - for transportation funding, for energy reform, for a national or state greenhouse gas policy" (PlaNYC, 11), and for "creating a new regional financing entity, the SMART Financing Authority, that will rely on three funding streams: the revenues from congestion pricing and an unprecedented commitment from New York City that we will ask New York State to match" (PlaNYC, 13). In addition, it suggests establishing a City office to promote brownfield planning and redevelopment (PlaNYC, 45).

Lessons from *PlaNYC*

Characterizing PlaNYC:

1. PlaNYC is a comprehensive plan that aims to counter climate change.
2. The Plan integrates *climate change* into its planning components. Climate change played a central role in formulating the plan's problem, justification, and visioning and objective settings. The Plan's outcomes were also climate change directed.
3. PlaNYC is physically oriented. It promotes greater compactness and density, enhanced mixed land use, sustainable transportation, greening, and renewal and utilization.
4. PlaNYC applies an integrated planning approach, making use of the advantages of new urbanism, TOD, sustainable development, mitigation, adaptation, and monitoring institutional policies.
5. PlaNYC addresses future uncertainties related to climate change with institutional measures, and enhances the City's urban adaptive planning capacity. It recommends efficient ways of using the city's natural capital assets and pays special attention to strategies for providing New York with cleaner and more reliable power. It creates a number of mechanisms to promote its climate change goals and to create a cleaner environment for economic investment.

6. PlaNYC inadequately address social planning issues - such as social and environmental justice, diversity, poverty, economic development, and spatial segregation - that are crucial to NYC, the most diverse city in the world. It also fails to address the issues facing vulnerable communities due to climate change. New York City is "socially differentiated" in terms of the capacity of communities to meet climate change uncertainties, physical and economic impacts, and environmental hazards. PlaNYC calls for an integrative approach to climate change on the institutional level, but it fails to effectively integrate civil society, communities, and grassroots organizations into the process. The lack of a systematic procedure for public participation throughout the city's neighborhoods and among different social groupings and other stakeholders is a critical shortcoming, particularly during the current age of climate change uncertainty.
7. PlaNYC's focuses on GHG emissions reduction and lacks a proper adaptation strategy, or a strategy of preparing the city and its physical infrastructure for potential disasters caused by climate change shifting. PlaNYC did not make the desired shift toward planning for climate change and adaptation. It therefore seems clear that the planners of PlaNYC have not learned the lessons of Hurricane Katrina as well as they should have.

Advice to Planners for Planning to Counter Climate Change

1. *Planning to Counter Climate Change (PCCC)* is comprehensive and holistic in scope and in the issues it covers. It is integrative and multidisciplinary in its approach to the uncertainties and the complex and multidisciplinary phenomenon of climate change. PCCC integrates climate change into its major planning components. Climate change played a central role in formulating the problem, visioning and goal setting, and the outcomes.
2. *Planning to Counter Climate Change* integrates various planning approaches that aim to achieve its comprehensive objectives, and it is therefore able to utilize the advantages of new urbanism, TOD, sustainable development, mitigation, adaptation, evaluation, and monitoring policies.
3. *Planning to Counter Climate Change* must apply an inclusive, appropriate, and wide-scale approach to public participation.
4. *Planning to Counter Climate Change* must address the current and predicted needs of vulnerable communities. In addition to adaptation policies, hazard mitigation is a crucial aspect of this approach.
5. For their "ability to think the big, long-term thoughts about the interrelatedness and interdependency" (Schwab, 2010: 5) of climate change, planners are indispensible to efforts to counter climate change. They should therefore take on a leadership role and assume more control in fighting climate change on the city level.

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