Engaging community groups to promote energy efficiency, solar power and local agriculture

Executive Summary

Because NYC's many community based nonprofits have extensive networks and personal and neighborhood relationships, they can be effective marketing partners for citywide sustainability programs. This paper explores how community leaders can help create the entrepreneurial projects through which nonprofit groups can benefit both themselves and their constituents while becoming neighborhood catalysts for sustainability initiatives, with benefits for all stakeholders.

Possible Programs

Sustainability programs targeting community groups should include:
(1) enough incentive for community groups to promote them
(2) enough benefit for constituents
(3) value in the form of income, savings, goods, services, or social capital
(4) low entry and set-up costs
(5) applicability to NYC

Referral fees would encourage nonprofits to promote two existing initiatives to their constituents: energy efficiency upgrades and solar PV system installations.

Energy efficiency:
(1) Con Ed's Green Team program offers free energy efficiency surveys and discounts of up to 70% on equipment upgrades for lighting, heating, ventilation and cooling.
(2) On average, 15% of businesses citywide that get the free survey follow up with purchasing the discounted upgrades.
(3) The percentage purchasing upgrades rose to over 40% when a Long Island City business group promoted the program to its constituents.
(4) Citywide participation in the program would similarly increase if Con Ed were to provide incentives for community group referrals that led to purchases of upgrades.

Solar PV system installation:
(1) Government incentives and tax breaks cover about 80% of installation costs.
(2) Community groups can promote installation with installer referral agreements.

Urban Agriculture:
Changing our food system has become an important City policy concern because it can alleviate a lot of problems at the same time. Access to and consumption of affordable, healthy food will help alleviate chronic health conditions and thus reduce health care costs. Growing and manufacturing more food within the City and State will reduce greenhouse gas emissions, reduce transportation costs, and protect against volatile oil costs and fuel supply problems. Purchasing more of NYC's $30 billion food budget from in-state sources would boost the regional economy.

Steps toward transforming the City's food system are set out in PlaNYC, the sustainability plan of the Bloomberg Administration, as well as reports from Council Speaker Christine Quinn, Manhattan Borough President Scott Stringer, and academic experts at Columbia University. Initial steps have so far have been uncontroversial. However, when continued efforts infringe on the profits of large entrenched industries in the NYC food market it will trigger their opposition, as happened with congestion pricing and is now taking place around the proposed large soda ban. It would be prudent to build public support for the next steps in our food system upgrade.

Realizing the Potential**.** One way to do that is the Pride of New York program, which encourages consumers to recognize and buy more agricultural products grown and processed within New York State. Another way is to enable NYC community groups to get directly involved in putting some of NYC's thousands of acres of rooftops and 52,000 acres of backyard space into productive use. Community groups and citywide gardening advocates could partner to train residents in farming skills and to aggregate and sell produce locally.

Inspiring distribution models:
(1) At its farmers market, East NY Farms reserves a table for selling vegetables grown in the neighborhood, aggregated from many small plots and producers and providing income for local gardeners and itself.
(2) BK Farmyards proposes linking residents with gardening space and skilled gardeners without land access, and then linking customers with the resulting produce.

Innovative urban farming techniques:
(1) Winter farming in greenhouses and inexpensive hoop houses.
(2) Sub-irrigated planters (SIPs) which soak water upwards to the plant through capillary action and thus reduce water use: portable, lightweight SIPs made from plastic buckets and boxes can turn vacant lots into temporary farms.
(3) Small Plot Intensive (SPIN) farming: intercropping and scheduled crop rotations lead to high vegetable yields in small spaces.

Business ideas for organic waste recycling:
Each year, the City spends $300 million to export 3.3 million tons of City-collected waste, 18% of which is organic and mostly food waste.
(1) Green roofs and rooftop farming require special lightweight soil mixtures which can be produced from NYC's own organic waste steam. Waste such as wood chips heated in the absence of oxygen turns into light weight, water absorbent charcoal (biochar). Amending soils with biochar is also a stable, inexpensive way to sequester carbon.
(2) An exemption from or a creative workaround to waste hauling regulations aimed at excluding criminal enterprises could support development of a local compost industry.
(3) Food waste could be picked up for composting locally by community groups, using industrial bicycle carts for waste collection.

Turning community groups into active participants in sustainability initiatives would be a huge benefit for NYC. Exploring ways to make that happen should be a top priority.

Engaging community groups to promote energy efficiency, solar energy and local agriculture

Efforts to make NYC more sustainable don't have to depend exclusively on government programs at risk of budget cuts or green businesses that require large investments and advanced technical or business skills: to help create local entrepreneurship we can enlist NYC's many community-based nonprofits, such as 501(c) 3 groups serving low income communities, civic groups, local development corporations, business improvement districts, and religious organizations. NYC agencies and their nonprofit contractors have day-to-day experience in getting companies to participate in a variety of business assistance programs: insights from that body of practice can be applied to sustainability endeavors. Organizations with established reputations can reach out to extensive networks of neighbors and constituents and be much more effective promoters of programs and services than unknown third parties. *(See Appendix B.)*

Promoting these programs has shown that business owners:

- are interested in programs that can make or save them money
- rarely make investment decisions based on greening their public image or corporate social responsibility
- are less likely to participate in programs that require high initial investment, have complicated paperwork, are unfamiliar, or are perceived as risky
- are more likely to participate in programs that have low initial investment, a quick return through income or savings, and early, quick, positive results
- often ignore beneficial programs because they're busy
- are much more likely to pay attention and take action if introduced to a program through a trusted third party

Third parties are more motivated to contact business owners about a program if they:

- are paid employees of that program
- are required to do so as part of a grant or contract
- have another financial incentive

The business models that would be most appropriate for community-based groups promoting sustainability efforts would:

- generate some modest yield in income, production of goods, or cost savings
- require low initial investment
- not need many specialized skills
- be suitable for administration by non-profit groups serving low-income communities in NYC

Compilations of socially responsible design ideas, such as the Buckminster Fuller Challenge, Carrot City for urban agriculture, and Design with the other 90% for informal urban settlements, include many valuable projects. However, most of them are unsuitable as entrepreneurial projects for NYC nonprofits, as they require substantial investment, don't provide income, or cannot easily be applied to NYC.

Nonprofit groups serving low income communities may see sustainability through the lens of environmental justice, which tracks discrimination in enforcing environmental laws and siting polluting industries and may focus on immediate problems such as pollution, poverty, and crime. However, constituents of such groups will be increasingly impacted by climate change and economic turmoil, for reasons explained in a report from Community Action Partnership (CAP), which suggests local coping strategies for nonprofit community groups to address simultaneously both historical and new concerns. These entrepreneurial programs can help community groups help their communities adapt to changing circumstances.

Possible Projects for Community Groups to Promote

Following are a few projects that can meet the above criteria. For some of them, slight regulatory or procedural changes will be needed to make the projects possible.

Con Ed's free energy efficiency surveys and discounted equipment upgrades

Although NYC has some of the highest electric rates in the country, and businesses routinely cite high energy costs as a major headache, very few small businesses take advantage of government energy efficiency programs, because they are often confusing and difficult to navigate.

One of Con Edison's Green Team programs (Small Business Direct Installation), rolled out in 2009, is more accessible. After receiving a free energy efficiency survey of their facility, business owners get a brief report of suggested upgrades for lighting, heating, ventilation and cooling systems. The report shows how long it will take for savings from the upgrades to pay for the discounted installation costs, almost all of which pay for themselves within a year. Con Edison offers a 70% discount on the installation costs of upgrades. Costs are instantly covered by grants, so clients do not need to fill out applications or wait for rebates. Despite widespread advertising and contractors promoting the surveys door-to-door throughout the City, many businesses assume it's too good to be true. Contractors report that only 15% of businesses that consent to a free survey proceed to purchasing the recommended energy efficient equipment upgrades.

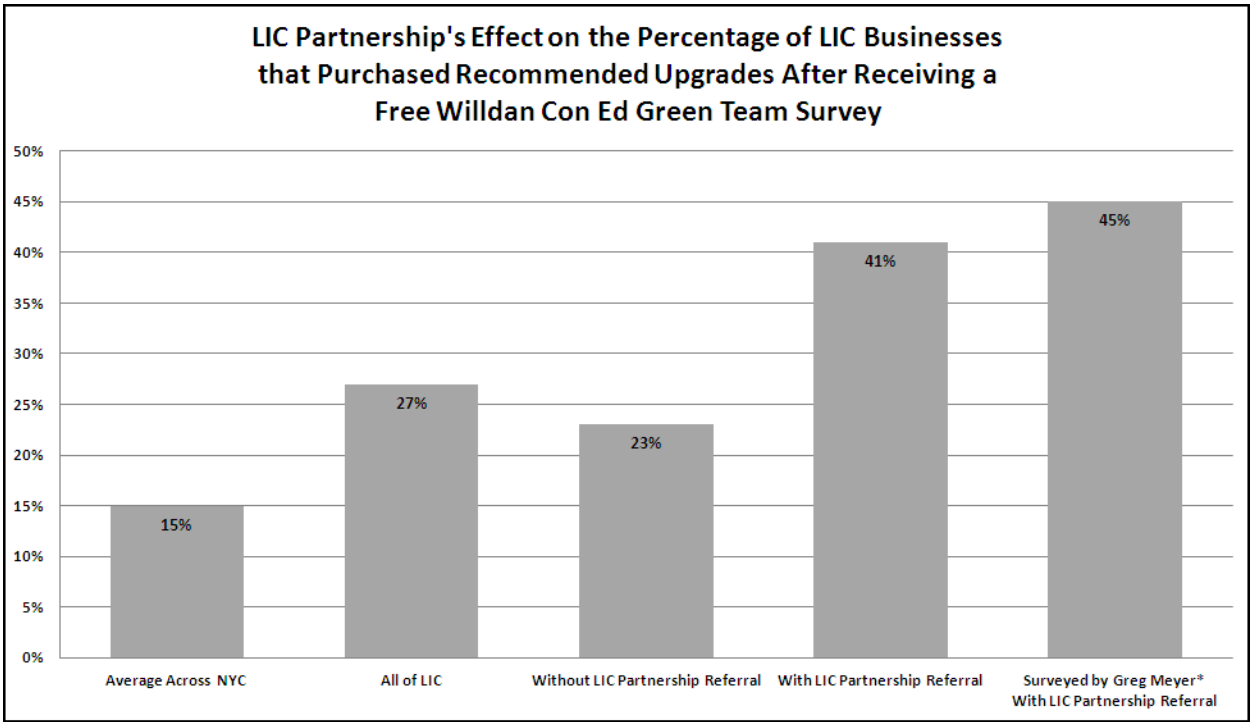
In 2010-2011, LIC Partnership, a local economic development nonprofit serving Long Island City in Queens, mailed, phone and emailed many of its business constituents

about the Green Team program. LIC Partnership staff directly referred many individual businesses to the staff of Willdan, the Con Ed contractor assigned to the area.

Willdan staff surveyed a total of 868 business customers in Long Island City between January 1, 2010 and May 31, 2012, and 238 of those businesses (27%) proceeded to purchase some of the upgrades recommended in their survey reports.

Of the 654 of 868 surveyed businesses not contacted by LIC Partnership staff, 151 (23%) went on to purchase upgrades.

When LIC Partnership staff personally contacted and referred 214 businesses for surveys, 87 (41%) purchased upgrades. When LIC Partnership staff collaborated with Greg Meyer, a single Willdan employee, 23 of 51 businesses referred (45%) purchased upgrades. (Link to full data set.)



Average Across NYC	All of LIC	Without LIC Partnership Referral	With LIC Partnership Referral	Surveyed by Greg Meyer* With LIC Partnership Referral
As Reported by Greg Meyer	238/868	151/654	87/214	23/51
15%	27%	23%	41%	45%

*At the beginning of the program, LIC Partnership referrals were made available to many Willdan employees through a manager. Once Greg Meyer became the only account representative for LIC, all LIC Partnership referrals were sent directly to him.

The main obstacle I encounter in this program is an endemic lack of trust. When cold-calling, I have found that customers generally sign up for energy efficient retrofits 15% of the time, and the few that do generally take 6-8 months to get the project going. In LICP's warm market, I've found the

> majority of customers they directly refer me to elect for an energy efficiency retrofit, and they generally do so 1-2 months after initial contact. The end result allowed me to successfully navigate a high-efficiency network based off of mutual trust and respect with a high close rate instead of the more commonly used system of pavement-pounding, wishing and hoping.
> - Greg Meyer, former Con Ed/Willdan contractor in LIC

If Con Edison were to incentivize nonprofits to promote the Green Team program, citywide participation would increase sharply.

Providing nonprofits with 3% of the total cost of any facility upgrade generated by their referral would motivate many nonprofits to start lobbying their personal contacts on behalf of energy conservation and cost savings. Besides reducing electricity demand on the grid and lowering risk of power outages, this program would enlist neighborhood leaders across the City as grassroots spokespersons for energy conservation. By reducing the amount of fuel burned in power plants and building boilers, it could also reduce the high rate of asthma attacks and other health problems in many of the neighborhoods in which these community groups work.

Solar PV Installation

To replace some of the electricity otherwise produced by burning fuels, NYC is working to accelerate the installation of more rooftop mounted solar photovoltaic (PV) systems which convert sunlight into electricity. Since 2005, the amount of solar photovoltaic capacity installed within city limits has more than tripled, from 1.47 megawatts (MW) to 5.65 MW. Recent estimates suggest the City could reach 45-70 MW of solar PV capacity in the next five years (p. 9). In addition, solar thermal systems which heat water can displace some of a building's need to burn fuels to make hot water. Solar thermal systems can be easier to install and cheaper than solar electric systems.

A consortium of city and state government agencies and organizations - the NYC Solar America City Partnership - is working to streamline the complex and expensive process whereby systems are permitted, inspected and connected (p. 6). In addition, new policies, programs, and incentives (pp. 18-19) will help the NYC solar market grow dramatically over the next several years. Today building and business owners who want to adopt solar still face high upfront costs for long-term return. While government incentives and tax breaks typically cover about 80% of their installation cost, applying for them and selecting the best financing options is complex: only solar installers or professional expeditors have the expertise to navigate that process, even though some financing schemes involve no out-of-pocket costs and are cash-positive from day one.

Nonprofit groups can position themselves right now to promote solar by identifying potential solar adopters among their constituents. Candidates include building owners, long-term tenants in commercial buildings, and owners/tenants of multi-family

residential properties with at least 3,000 square feet of roof space unobstructed by shade from trees, another building, vents, or rooftop equipment. Roof space can be located and initially assessed using Google Maps or the NYC Solar Map. Interested constituents can be referred to solar installers who will perform free onsite assessments, help identify the right PV system and financing options for the customer, and assist in applying for government benefits.

A few NYC nonprofits have already entered into referral agreements with PV installers. Several installers have agreed to pay Long Island City Partnership a fee of 3% of total project costs from referrals that lead to completed installations. (A copy of the agreement is available on request.) Following postal, email and phone outreach in 2011, one project has been completed and another is underway in LIC. This approach can be used by any nonprofit to earn additional income while supporting the City's solar program. As the process of installing solar systems in NYC becomes more streamlined, less expensive and less inconvenient, more customers will be receptive to installing solar systems.

Changing the Food System

A growing number of food policy advocates and elected officials want a complete overhaul of the ways through which New Yorkers get food. They believe that:

> The way to comprehensively affect healthy food affordability, accessibility and awareness is to approach food not just as a commodity but as an infrastructural system, equivalent to our water, transportation and energy systems, that needs to be managed and considered in all urban and regional planning efforts. This approach is necessary in order to create a more resilient, secure and predictable food supply to our urban areas.
> "Regionalizing the Food System for Public Health and Sustainability," *Columbia University Urban Design Lab, November 2010,* p. 17.

Issues surrounding the City's food supply, from production, distribution, and consumption to waste disposal, are addressed in the Bloomberg Administration's PlaNYC 2011 update, Manhattan Borough President Stringer's FoodNYC report, and Council Speaker Quinn's FoodWorks Plan which characterizes the NYC food system as not sustainable and not secure:

> [O]ur food system faces a number of issues that compromise its long-term sustainability. Agricultural production is energy intensive, greatly contributes to greenhouse gas (GHG) emissions, and is not economically viable for many farmers. Food processing and distribution require large non-renewable energy inputs and further impact our

> environment. There is significant waste throughout the system, both from discarded food and food packaging. Moreover, New York City is not fully capitalizing on its economic power to create good jobs and economic opportunity at each phase of the food system.
> "Foodworks: A Vision to Improve NYC's Food System," *NYC Council, Nov. 2010*, p. 7.

Improving energy security and food security

Food is shipped a long way by truck, train and plane to NYC. As the finite fossil fuel sources upon which we depend encounter constraints, we must prepare for fuel price and supply to be increasingly volatile. Growing more of our food closer to where it is consumed will reduce transportation costs and increase food security. *(See Appendix A.)* The many victory gardens grown during World Wars I and II were very successful in conserving fuel. Widespread public gardening will help educate New Yorkers about the importance of regional food production and will be increasingly cost-effective and desirable as a supplement to commercial agriculture.

> While urban agriculture cannot supply the entire city with all of its food needs, in certain neighborhoods it can significantly contribute to food security. There are a number of neighborhoods where a confluence of factors makes urban agriculture a particularly attractive and effective means of addressing multiple community challenges. These factors include low access to healthy food retail, high prevalence of obesity and diabetes, low median income, and comparatively high availability of vacant and other available land. These issues are all correlated, and it is in these areas where urban agriculture could have the greatest impact on food security.
> "The Potential for Urban Agriculture in New York City**,"** *Columbia University Urban Design Lab, 2012,* p. 3.

Improving public health

The NYC poverty rate rose to 21% in 2010, which means that close to 1.4 million New Yorkers can't afford healthy food choices. Over 3 million New Yorkers live in food deserts - communities in which access to affordable and nutritious food choices is limited – as do more than 23 million other Americans. In the last 15 years the number of New Yorkers with diabetes has doubled to 700,000, and 40% of NYC children are overweight or obese, which is often a precursor to diabetes. These trends link to higher rates of chronic diseases and rising health care costs. The Columbia study cited above concluded that we must change our entire food system to address these crises in public health. Through graphic ad campaigns, NYC is aggressively drawing attention to already well-known public health issues like diabetes, smoking, big portions and sugar-

laden drinks. To get people to eat healthier, we must increase demand for healthy foods and improve access to affordable fruits and vegetables through projects like school gardens, which demonstrate that kids who grow vegetables are more likely to eat them.

Gaining public support: seizing economic opportunity

NYC City Council's Foodworks Plan has proposed ways to get the NYC region growing, processing and distributing more of its own food. It's hard to argue with the general goals of the food system transformation these officials and advocates propose – healthier diets, more agriculture and business within New York City and State, more efficiency and less waste. Efforts to improve the NYC food system thus far have been uncontroversial. The NYC City Council has already passed a few laws based on parts of the FoodWorks Plan.

On the other hand, the NYC food market is big business. Each year $30 billion is spent on food in NYC (FoodWorks, p. 3). Eventually, some initiative will threaten an established industry and will ignite well-funded, sophisticated opposition. The fate of congestion pricing serves as a warning. When Mayor Bloomberg's PlaNYC was introduced, its centerpiece proposal was congestion pricing, which would have created new tolls for drivers into Manhattan to help fund the City's mass transit system. However, PlaNYC's groundbreaking portfolio of sustainability policy initiatives was created by Administration staff with little community participation, so when fierce opposition arose from tax-averse suburban commuters, the effort collapsed: not enough public support had been built to defend it.

There's no guarantee that PlaNYC and other Bloomberg Administration sustainability initiatives will continue past 2013. To turn vision into reality, public support for transformation of the food system must be developed beyond a few government officials with finite terms and the relatively small food activist community.

The Foodworks report sensibly aims for a broader audience by focusing on the economic opportunities in food system transformation. It details the benefits of a localized food system for regional farmers, food processors and manufacturers, and retail businesses (pp. 3-5).

Redirecting City food purchasing from national to regional sources will provide additional economic opportunity for New Yorkers. Regional farmers can be linked to urban institutions, wholesalers and retail customers through a variety of markets and new procurement guidelines. Urban food production also offers possibilities for getting New Yorkers directly involved in food system transformation, even though it can provide only a modest share of the City's food needs.

> Urban agriculture can play an important role in community development. The benefits of urban agriculture are not limited to the provision of food, with many advocates citing

> community empowerment, environmental justice, public health, and education and training as primary goals. Urban agriculture can be a means of transforming underutilized or neglected space into a public resource, providing opportunities for social interaction, greater community cohesion and self-sufficiency, and engagement for young people in underserved neighborhoods.
> "The Potential for Urban Agriculture in New York City," *Columbia University Urban Design Lab, 2012,* p. 2

As this invaluable report from the Columbia University Urban Design Lab explains, urban agriculture can't supply all the City's food needs but it can play an important role in community development, significantly contribute to food security in some neighborhoods, enable entrepreneurs to establish viable businesses, and catalyze larger food system transformation (pp. 2-5). This economic appeal can be broadened by showing how projects aligned with local food can offer direct benefits not just to businesses, but to the City's many nonprofit and community groups, especially those serving low-income communities. By combining several innovations now being piloted in NYC, neighborhood scale farming can become a financially attractive option for promotion by nonprofit groups within local networks.

Locating farming spaces

Even though vacant land in NYC is more profitably used for real estate development, spaces such as roofs and backyards offer abundant possibilities for farming. "The Potential for Urban Agriculture in NYC," a report from the Columbia University Urban Design Lab, states there are over 52,000 acres of backyard space in NYC (p. 38) and about 3,000 acres of flat roof space on large NYC buildings suitable for rooftop farming (p. 40). There are "clusters of potentially suitable roofs in the Greenpoint, Brooklyn, and the Maspeth and Long Island City neighborhoods of Queens, which is one of the most promising areas in the nation for rooftop agriculture" (p. 44). Identifying the spaces and the innovative social, gardening and business practices that can be productive will be an exploratory process in which community organizations can have an important role.

Selling neighborhood-grown produce at community markets

At their farmers markets, a few NYC community groups are already aggregating and selling vegetables grown in their neighborhoods. It provides modest extra income for local gardeners and some revenue for the group.

East New York Farms works with over a dozen community and backyard gardens in East New York, Brooklyn and runs a community-supported agriculture (CSA) program, two farmers markets and two urban farms. Community gardeners can sell small amounts of produce at the share table of their farmers market: at the start of market

hours, gardeners drop off their washed and bunched produce at the share table, where an intern records, counts and weighs it. Their staff can also pick up harvested produce from the gardener or harvest it themselves. Produce that doesn't sell is donated to the food pantry. The more each gardener does for the business, the more money that gardener makes: gardeners who attend meetings and do outreach, harvest their own produce and drop their produce off at the market keep 90% of the sales price, gardeners who do two of those things keep 80%, gardeners who do one keep 70% and gardeners who do none keep 60%.

Most of the produce for a farmers market launched by **The BLK Projek** at Father Gigante Plaza in the Longwood / Hunts Point community of the South Bronx comes from upstate NY farms, but a share table will be dedicated solely to produce from local community gardens. Vendors receive a commission from sales at their table.

The Brooklyn-based decentralized farming network called **BK Farmyards** is linking owners of backyard green space or temporarily vacant land with experienced gardeners who can cultivate produce for collection and sale by BK Farmyards. They are currently involved with five farmyards.

As production increases, groups could market their vegetables at wholesale prices to local restaurants. If neighborhood food production scales up sufficiently, produce could be sold to schools and institutions. What if NYC procurement regulations encouraged institutional purchase of food grown not just within the State but from within the City? It could create a market for countless new backyard farmers – as well as for community groups that could aggregate produce and promote partner training programs.

Using innovative urban gardening techniques

Gardening can continue year round in **greenhouses.** Changes in NYC regulations could open up 1,200 acres of commercial rooftops for greenhouse farming. **Rooftop greenhouses** will be an important part of NYC's urban farming future, but are probably too expensive for nonprofits. Innovative but less costly techniques can be used by individuals and community groups to make decentralized urban farming possible throughout the winter in vacant lots, temporary locations, and on rooftops – extending the capacity of neighborhood gardener/community group collaborations.

Farming on **vacant lots** has advantages over rooftop farming: besides lower costs, there is less wind, more flexibility in growth mediums, and ease of access. 596 Acres is helping would-be urban gardeners find nearby vacant public lots.

Farms with permanent legal access to vacant lots and with access to skilled carpenters can build greenhouses with easily available, inexpensive materials, as done by the greenhouse at Brooklyn Rescue Mission in Bed-Stuy. However, access to vacant lots is often temporary.

Inspired by urban gardeners in Nairobi, Kenya who fill sacks with soil, cut holes in the sides, and plant vegetables in the holes, Feedback Farms is experimenting with mobile planters that can turn vacant Brooklyn lots into **temporary farms**. Stacked on wooden pallets for drainage, their lightweight, low cost **sub-irrigated planters** (SIPs) can be moved mid-season if needed. SIPs are planting containers in which the water is introduced from the bottom, allowing the water to soak upwards to the plant through capillary action. SIPs have been used in the US for over 100 years. Many do-it-yourself SIPs can be made from plastic buckets and boxes, and their manufacture for sale to urban gardeners can become a cottage industry. In a more direct copy of the Kenyan sack growing system, Feedback Farms is testing the use of small sacks, as well as super sacks, a generic industrial bulk bag.

Active Citizen Project (ACP) is setting up community-operated farms and food distribution systems using the **SPIN** method. The SPIN farming method emphasizes intercropping and scheduled crop rotations for high vegetable yields in small spaces and is recommended by permaculture expert Rob Hopkins. ACP plans to sell produce to commercial customers and to community members at 50-70% of market price.

Creating a tax credit for third-party investors in green roofs and rooftop farms

The S.W.I.M. Coalition (Stormwater Infrastructure Matters) has proposed several improvements to the City's green roof property tax abatement which would encourage rooftop farming as well. The bulk of the recommendations include streamlining City green roof permitting requirements and increasing the per-square foot abatement. Another recommendation would allow nonprofits, which do not pay taxes and cannot benefit from tax abatements, to transfer their tax credits to third-party investors so they can install green infrastructure/urban agriculture projects. According to Robert Crauderueff, coordinator of the S.W.I.M. Coalition, "by extending and improving the green roof tax abatement, the City will take a step toward swimmable waterways in New York City. Urban agriculture, a type of green infrastructure, uses storm water as a resource while supporting multiple needs of communities in our city."

Turning organic waste into biochar and compost

> We currently spend more than $1 billion a year to manage solid waste including $300 million to export 3.3 million tons of City-collected waste. These costs are projected to rise exponentially. We must take aggressive steps to make our waste management system more environmentally and economically sustainable.
> PlaNYC, p. 137.

New Yorkers are familiar with one simple, decentralized way of turning waste into cash – the reclaiming of empty cans and bottles for recycling deposits. Similar but more

lucrative business opportunities exist for entrepreneurs and community groups who want to use the organic material, much of which is food waste, which constitutes about 18% of NYC's waste stream. Instead of trucking it to out-of-state landfills, we could compost or recycle organic waste, as recommended by PlaNYC's 2011 update. This vast flow of organic waste can be turned into materials required for urban and rooftop farms: compost and a lightweight soil amendment known as biochar.

Biochar

Installing more green roofs has become a priority for the City. Because common black tar roofs absorb sunlight and get very hot in summer, they heat the buildings beneath them and contribute to the urban heat island effect. Coating rooftops with highly reflective white paint keep buildings cooler, but not as much as green roofs, which have the additional benefit of minimizing stormwater runoff that can flood City sewers. Green roofs with shallow plantings of hardy perennial sedums in less than six inches of soil and rooftop farms require lightweight soil amendments to lessen the weight on supporting roofs. A mixture of compost and biochar can substitute for the special lightweight soils that urban farmers and green roof installers would otherwise have to buy.

Instead of shipping woodchips to faraway landfills, we could, as suggested by Alec Baxt of FarmingUp.org, convert them to charcoal by pyrolysis, a controlled burn of carbon-based materials in the absence of oxygen. Since charcoal is extremely stable and does not convert readily to carbon dioxide, its production is carbon negative. When charcoal is used as a soil amendment instead of a fuel, it is known as biochar. Its permanent storage in soil is a low-cost highly effective form of carbon sequestration. Biochar retains moisture and nutrients well and is incredibly light-weight. Also, pyrolysis generates heat which can be used directly or for cogeneration of electricity. Thus, biochar – in combination with compost - provides renewable energy, carbon sequestration, and the creation of a saleable product that can increase the amount and quality of green infrastructure and urban agriculture in NYC.

Compost

Many New Yorkers want to compost their food waste, but don't have the space or access to the few scheduled food waste collections at a handful of farmers markets. A few individual households are willing to pay Vokashi a monthly service fee to pick up their food waste. The firm uses a Japanese method of bacterial fermentation, which allows food waste to be stored in airtight plastic buckets for weeks. Vokashi picks up the food wastes for composting in community gardens.

Composting advocate Greg Todd wants local residents driving industrial bicycle carts to pick up food waste from restaurants. This method has been pioneered in Northampton, Massachusetts but can't be applied in NYC due to waste hauling regulations aimed at excluding criminal enterprises.

Today we can buy compost bins and potting soil at gardening supply stores. Wouldn't it be good to be able to buy brands of locally produced compost, perhaps identified by neighborhood or by the community nonprofit that organizes neighborhood food waste pickups and charges local businesses? Perhaps their commercial compost sales would subsidize a lower cost sale of compost back to community gardens. The City could support the development of a NYC-produced compost industry by (a) creating an exemption to waste-hauling rules for bicycle-riding entrepreneurs, (b) guiding partnerships between licensed waste hauling companies and local composters, or (c) convening experts and advocates to identify a workaround.

What else could be done with food wastes? Could they be fed to chickens and cycled back as eggs? Even though it's increasingly popular to raise chickens in NYC as well as other US cities and suburbs, and some commercial chicken operations raise hens solely on food scraps and insects in their compost piles, it would not be profitable considering the very low current cost of eggs.

We could also copy the example of the two UC Berkeley seniors who discovered they could use coffee grounds to grow oyster mushrooms. Their Oakland-based company now employs 21. They're selling mushroom growing kits at Whole Foods, as well as bags of compost. Even though gourmet mushrooms sell for a much higher price than eggs, NYC's abundant supply of coffee grounds is currently thrown away.

Where can NYC community groups start?

Community based nonprofits are now able to promote solar PV system installation to their constituents. Interested groups can contact LIC Partnership for marketing information and a sample referral agreement to share with solar installers. Nonprofits are also immediately able to promote Con Edison's energy efficiency upgrade program without compensation. If Con Edison offered compensation to nonprofits for marketing their program, citywide participation would increase. Supporters of engaging community groups in promoting energy efficiency are encouraged to contact Con Edison.

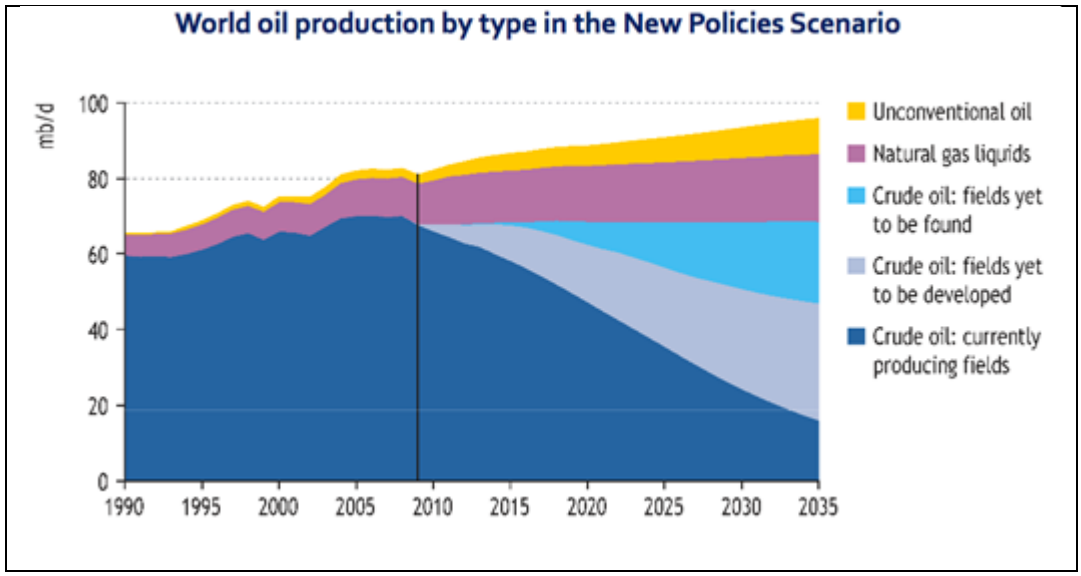
Advocates of food system transformation are invited to explore how the new business models and innovative practices outlined here can be combined to recruit community organizations as partners in promoting urban agriculture. Citywide urban gardening groups can partner with other City agencies, elected officials and community groups, to catalyze the production, sale and distribution of vegetables in their neighborhood. One place to start would be a neighborhood inventory of existing community gardens, NYC greenmarkets, CSAs, and local groups with an interest in health and social services. Another would be an inventory of areas such as vacant lots, large roofs, and backyards that could be turned into gardens. With the appropriate partnerships, even community groups without any background in agriculture could use their network of local contacts to serve their constituents and support local economic development.

Appendix A

Oil price volatility may increase long distance shipping costs.

Increasing the amount of NYC's food that is produced within both the metropolitan region and New York State will buffer the impacts of volatility in fuel price and supply.

World crude oil production has remained on a plateau for about seven years. Even though the use of less energy-dense oil sands and corn-based ethanol has increased total world *liquid fuels* over this same time period, the International Energy Agency (IEA) admitted in late 2010 that the peak of conventional crude oil production occurred in 2006 (http://www.iea.org/publications/freepublications/publication/weo2010.pdf, World Energy Outlook 2010, IEA, p. 122; original of graph below).



As several reports warn, at some point in the next few years higher production of unconventional oil won't be able to make up for the decline of conventional oil fields and the rising demand for oil in developing countries. In 2010 the annual planning report for the U.S. military warned that despite technological innovations and non-conventional oils "by 2012, surplus oil production capacity could entirely disappear, and as early as 2015, the shortfall in [worldwide] output could reach nearly 10 million barrels per day" (p. 29). A group of British companies issued a report warning U.K. government and businesses to prepare for an oil crunch within 5 years. Lloyd's of London and Chatham House have also advised all businesses to begin scenario-planning exercises for the oil price spike they anticipate in the medium term.

Volatility in oil price and supply, higher oil prices, and oil price spikes are likely. Even though NYC officials have been notified of this issue, it has not entered the official discussion. For example, the NYC Office of Emergency Management has plans for disruption of electric service but not for oil price shocks, as do the cities of San Francisco, California, Portland, Oregon, and Bloomington, Indiana. Their reports would be valuable reading for NYC business, civic and government leaders.

Energy sources such as solar, wind and geothermal can eventually power much of our economy, and we should increase their capacity as quickly as possible. However, since oil provides about 90% of the liquid fuels on which much of our transportation and building infrastructure runs, the transition will not be simple. Oil provides about 1/3 of the world's total primary energy supply. The most valuable strategies for reducing oil use besides regionalizing agriculture include reducing energy use to European standards, scaling up renewable power, scaling up public transit such as rail, upgrading electricity transmission and storage infrastructure, and reducing the miles food travels.

Appendix B

Lessons from white roof painting

The City's NYC CoolRoofs program is a laudable effort to encourage building owners to mitigate the summer's peak electric demand by cooling their rooftops with highly reflective white paint. After a free survey showing whether a roof qualifies, a program manager recommends a coating, estimates cost, and sends a supervisor and volunteer crew to apply the coating for free. Because coated roofs are as much as 75 degrees cooler on hot summer days than standard black tar roofs, they reduce demand for air conditioning, the City's carbon emissions, the urban heat island effect which makes NYC 5-7 degrees F hotter than the surrounding countryside, and the risk of summer blackouts from the 30% rise in demand on the hottest days.

Although a clear win for the City, cool roofs provide limited benefits for the individual building owner. The labor cost for applying the coating is about 50 cents per square foot. As white roof coatings range from $70 to $140 per five gallon container, project costs can add up quickly.

Since business owners are more likely to invest in projects that will pay for themselves in three years or less, white roof painting is most appropriate for a commercial building that:

- is owner occupied
- was built before 1980
- is not energy-efficient or well-insulated
- has an existing standard black asphalt/granulated/bituminous roof
- is only one or two stories tall, with more surface area than mass

Identifying the few owners or managers of commercial buildings that would meet these criteria is a difficult and time consuming job. LICP's campaign and community outreach connected about twenty building owners, mostly nonprofits able to access donated coating, to NYC CoolRoofs. However, NYC's 67 Business Improvement Districts and many local development corporations are not required to promote the Cool Roof program.

While the City as a whole benefits when building owners coat their roofs, the program only offers a clear financial benefit to a tiny minority of building owners. Nonprofits that could identify those owners are not required or incentivized to contact them on behalf of NYC CoolRoofs. Thus, it is very difficult for the program to gain participants.