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SUSTAINABILITY DISTRICTS FOR NYC

Building an Equitable and Resilient Future



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SUSTAINABILITY DISTRICTS FOR NEW YORK CITY

HOW ECO DISTRICTS & 2030 DISTRICTS WILL BENEFIT NYC



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INTRODUCTION

New York City has long been a world leader in developing and implementing sustainable and resilient planning processes and programs. Ranging from the NYC Mayor's Office of Sustainability's "80 by 50" to the NYC Department of Environmental Protection Green Infrastructure Program to New York State's Reforming the Energy Vision, sustainability programs are reframing the way cities look at becoming more efficient, equitable and environmentally sound. In the recent past, ambitious renewable energy and emission reduction goals, as well as green infrastructure and waste reduction programs, have been advanced by New York City mayors. In New York State, Governor Andrew Cuomo's 2015 State Energy Plan has set ambitious targets for 2030 that helped reinforce efforts on the path towards previously established 2050 goals. Following the success of former NYC Mayor Michael Bloomberg, current Mayor Bill de Blasio has also embarked on ambitious initiatives, but with an added emphasis on affordable housing, resiliency and equity issues. These existing city and state targets, combined with the newly established goals set through the Clean Power Plan and other federal programs, make environmental and social equity concerns central topics for discussion at all levels.

But to meet these goals, we need coordinated action.

Through a district model, existing programs and organizations will have a framework through which collective coordinated action can be pursued cost-effectively and successfully. They can often achieve environmental and social impacts that exceed the goals both of individual programs and state and federal mandates. District models break down silos, and local stakeholders of all types become leading

agents of change in their own communities. In the process, stronger and more cohesive communities grow.

The concept of a district model is not being invented for this proposal. There are two primary existing sustainability district programs already being utilized in cities across North America: 2030 Districts and EcoDistricts.

The primary purpose of this paper is to identify and present the ways that New York City would benefit from the establishment of 2030 Districts and Eco Districts.

2030 Districts are active in ten US cities and Eco Districts in ten, so lessons about how to establish sustainability districts already exist. New York City is, of course, different from other cities in North America, and so we looked at how these two programs can be adapted.

We acknowledge the challenge of environmental justice, and the need to address the high impacts on low-income communities from climate change due to the population's vulnerability to health, safety and economic damage. While we do not explicitly focus on this challenge, we believe that sustainability districts can serve the causes of environmental justice and equity by helping the city as whole achieve greater sustainability and resilience.

In Part 1, we begin with an introduction to the concept of sustainability districts, surveying the development of various district concepts with specific attention paid to 2030 Districts and EcoDistricts. Building on this, in the second section of Part 1, we describe several selected districts in North America from each program: how they were formed and how they are funded, and the objectives and protocols they have put in place in order to accomplish their goals.

In Part 2, the research focuses on existing sustainability and resiliency programs – federal, state, city, academic, NGO and private -- that apply to NYC. Of interest here is how sustainability districts can interact with, assist and augment those existing programs, as well as how 2030 Districts and EcoDistricts can serve as incubators for and facilitators of new programming.

Part 3 elaborates on the case for implementing sustainability districts in NYC and then describes two sample neighborhoods as potential districts to illustrate how sustainability districts would work in NYC.

In the conclusion, we present recommendations for moving forward in the selection and implementation of sustainability districts in New York City. It is the premise of this report that NYC will benefit in myriad ways from the establishment of 2030 and EcoDistricts.

Building a more resilient city requires both building-scale solutions...and neighborhood-scale engagement and action.¹



Part 1:

Sustainability Districts

ANALYSIS

Defining Sustainability Districts

As with the word 'sustainable,' the definition of a sustainability district is not completely agreed upon. This description, from an Eindhoven University of Technology paper, seems a good place to start:

"Sustainable district development is a way of urban planning, where in all stages of the planning process the opportunities to achieve a high spatial quality are utilized, while the environmental impact is maintained at a low level. Both aspects have to be maintained over time, so that future generations can share this quality."¹

The definition, in its reference to both present and future generations, evokes the well-known "Brundtland Commission" definition of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."² In other words, a two-part definition in which sustainable development seeks to satisfy current needs while still providing for -- rather than "stealing from," as is the conventional practice -- the resources and quality of life of future peoples.

We can find a somewhat different take in a statement from a summit meeting of the EcoDistricts program, one of the district approaches that we will explore further in subsequent sections:

"EcoDistricts ... accelerate sustainable district- and neighborhood-scale regeneration and promote just, sustainable, and resilient cities and neighborhoods for all."³

This statement introduces the core concept of inclusivity of multiple stakeholders and equality for all stakeholders within a sustainability district. This is a concept that we feel is significant for the engagement of district scale thinking in New York City.

Another definition, this one from the Market Place of the European Innovation Partnership on Smart Cities and Communities, adds economic vitality, though as a secondary aspect, to the list of factors. "The main

Districts are the best scale to accelerate urban sustainability and resilience -- small enough to innovate quickly yet large enough to have a meaningful impact.

challenge in [sustainability districts] is to reduce energy use, environmental impact and carbon footprint, entail competitive industries for jobs and growth and at the same time ensure societal and social development and the well-being of citizens."⁴

What is meant by 'district' within the term sustainability district? And why focus on a district scale rather than the individual building or the larger city-wide scales? In "Architecture & Sustainable Development," Anne Françoise Marique and Sigrid Reiter observe "the sustainable neighborhood can be considered the meeting point between the individual sustainable building and the management of a sustainable city...this intermediate scale has been mostly neglected...whereas decisions made at the neighborhood scale have huge consequences...."⁵

They continue on to state "collective infrastructure (e.g. heating networks) is often more efficient and less expensive." Indeed this is one of the fundamental reasons for our working at the district level: that it is more efficient, manageable and achievable than working at the city scale and, at the same time, can have far greater impacts than focusing at the building or individual organization scale.

Marique and Reiter also call neighborhoods "the ideal scale" to experiment with new technologies because of their homogeneity while being large enough to guarantee the "transversality that constitutes the core of the sustainable development."⁶

These are all valid approaches to the concept of sustainability districts. Arguably, what's missing is a holistic, comprehensive definition taking all these points into account. So, with these factors in mind, we propose a definition of sustainability districts as:

A neighborhood-scale approach to encouraging and enabling sustainability and resilience, encompassing environmental, economic and social issues with both the present and future in mind. A districts approach

embraces a range of stakeholders from residents to businesses, environmental and civic organizations, utilities and municipal offices. The district scale is ideal because of both its manageability and its ability to create a living laboratory in which to demonstrate programs that might be then adapted to both other neighborhoods and city-wide programs. As a public/private endeavor, opportunities exist to initiate or expand upon the existing endeavors of individual building owners, businesses, civic and institutional organizations and individual citizens by bringing them together into a governance-structure supported organization (i.e., a cooperative or association structure). This central organization can then lead efforts including research and analysis of appropriate goals and programs, the funding and management of the programs initiated, and the ongoing benchmarking and reporting of the results of those programs.

SURVEY

Existing sustainability district programs

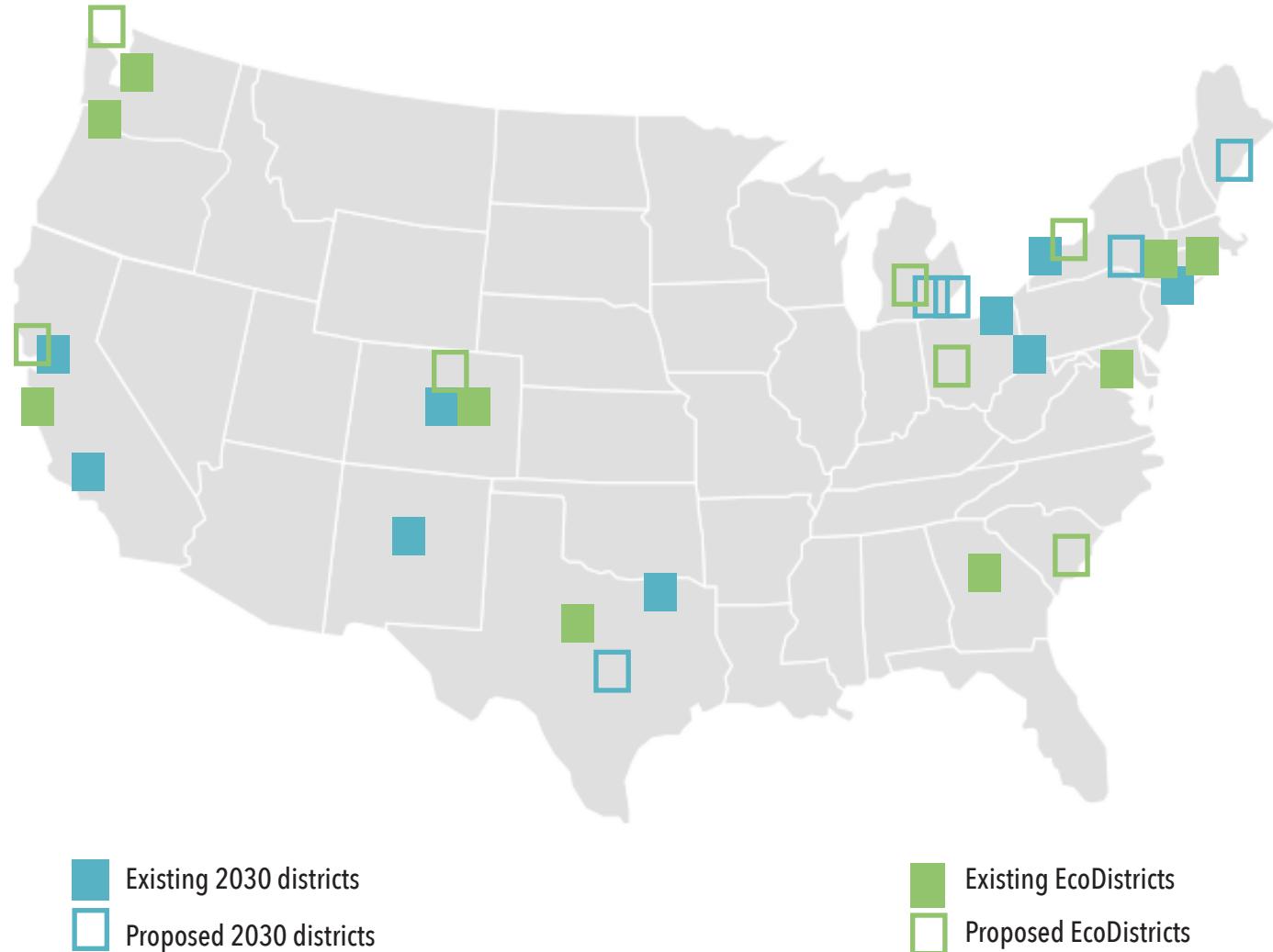


Figure 1: Existing and Proposed EcoDistricts and 2030 Districts in North America

In order to assess and learn from existing programs, we surveyed other sustainability districts. There are several ways these programs have created and set their goals. In many cases the programs are designed with goals targeting specific types of criteria such as net zero energy (Fort ZED), affordable housing (Enterprise Green Communities) and walkability (New Urbanism). Others are broader, addressing a wide range of environmental and social issues (e.g. LEED-Neighborhood Development).

Some programs are site-specific and have goals aligned with their locations (e.g. the Kansas City Green Impact Zone) while others are created with the intent of being applied to various locations (e.g. Cleaner, Greener Communities and STAR Communities). In the latter case, the programs have criteria that districts must fulfill in order to qualify for the program.

In this section, we describe the two programs, 2030 Districts and EcoDistricts, which we see as particularly applicable to NYC. Following this, there is a section providing a distilled comparison of the two programs. The comparison creates the basis for selecting which program is better applied to different neighborhoods of NYC. This is beneficial because the city is not homogeneous in its types and densities of development, and exhibits marked differences in the character of neighborhoods. The same district approach that is appropriate for a downtown core, such as lower Manhattan or downtown Brooklyn, would not be the right method for a more residential or mixed-use neighborhood such as East Harlem or the Rockaways.

Districts become living urban labs, demonstration projects that fill the gap between what the private and public sectors can accomplish on their own.

2030 DISTRICT

Description of the 2030 Districts program

2030 Districts are an outgrowth of the Architecture 2030 program, which is a national nonprofit organization working toward dramatic reductions in fossil fuel consumption and greenhouse gas emissions from buildings and cities. The Architecture 2030 Challenge calls for phased reductions in fossil fuel consumption to 50% of current levels in existing buildings and full carbon neutrality in new buildings and major alterations, with lower transportation emissions and water consumption, by the year 2030.

Architecture 2030 established the 2030 Districts Network to help form new districts and to coordinate resources, best practices, and collaboration among all the districts. Begun in 2011 in Seattle by Brian Geller and Architecture 2030, "2030 Districts are at the forefront of national grassroots efforts to create strong environmental

partnerships, coalitions, and collaboration around ambitious, yet achievable, measurable goals for existing buildings and infrastructure, as well as new development."⁷

"2030 Districts are led by the private sector, with local building industry leaders uniting around a shared vision for sustainability and economic growth. At the same time, they align with local community groups and government to achieve significant energy, water, and emissions reductions within our commercial cores."⁸ They are structured as public-private partnerships of property owners, civic organizations and community stakeholders designed to achieve broad sustainability benefits, primarily through improvements in building energy performance and reductions in fossil fuel consumption, carbon emissions and air pollution. The partnerships share



2030 Districts are at the forefront of grassroots efforts in cities across America to create strong environmental collaboration around clear, ambitious yet achievable sustainability goals for buildings and infrastructure¹⁰

resources and information, aggregate financing, collective action and public support, advocate for sustainable policies, and collaborate to spur technical innovation, adoption of best practices and environmental progress.

2030 districts are intended for dense urban areas:

"The Districts are focused on urban or urbanizing areas consisting of commercial and multifamily buildings. These geographical areas are typically resource intensive, and contain multiple properties under the same ownership and/or management, allowing for the rapid and effective implementation of resource efficiency practices. Once interested and prospective properties are identified, the 2030 District boundary is

established containing the highest concentration of interested properties."⁹

2030 Districts have been established in ten major North American cities (Seattle, Cleveland, Pittsburgh, Los Angeles, Denver, Stamford, San Francisco, Dallas, Toronto and Albuquerque) encompassing over 220 million square feet of real estate. There are also many more districts in the "Prospective" and "Emerging" stages.¹⁰ They are a growing network advancing sustainable energy and resource management goals at the district scale. The districts demonstrate that energy, transportation emissions, and water reductions can be achieved through collaboration, leveraged financing, and shared district member resources.

The partners in 2030 Districts commit to meeting the 2030 Challenge for Planning:

- New buildings, major renovations, and new infrastructure: an immediate 70% reduction in energy use below the national average, with incremental targets, reaching carbon neutrality by 2030
- Existing buildings and infrastructure operations: a minimum 20% reduction in energy use below the national average by 2020 with incremental targets, reaching a 50% reduction by 2030
- Quantitative water usage and transportation Emissions reductions targets by 2030¹¹

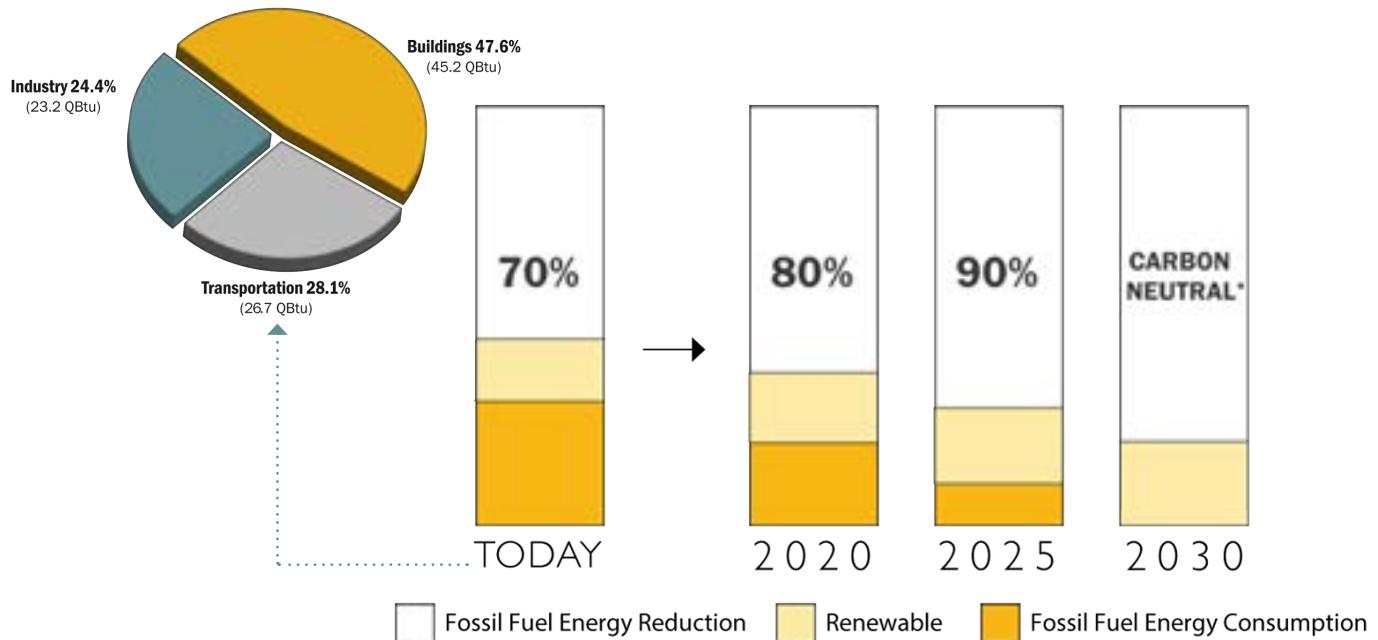


Figure 2: US Energy Consumption by Sector & The 2030 Challenge, “All new buildings, developments, and major renovations shall be carbon-neutral by 2030”

The Architecture 2030 organization facilitates emerging districts through a variety of support services and provides an established process for monitoring building energy performance. Successful 2030 Districts are concentrated in central business districts and are based upon the business case for energy cost savings and the value of environmental benefits. They are driven by the voluntary participation of property owners, civic institutions and community stakeholders in a contiguous geographic. They are sponsored by an established governance structure such as a Business Improvement District, foundation, a green building organization or neighborhood alliance.

There are three types of 2030 District Members / Partners:

- Property owners & managers
- Services stakeholders
- Community stakeholders

Architecture 2030 has defined three steps in forming a 2030 District, beginning with the organization of a prospective district.¹²

Phase 1:

Prospective 2030 District

A Prospective 2030 District is formed by establishing an exploratory committee. This committee consists of interested stakeholders who will provide outreach, guidance, and support for implementing the 2030 District model in their local community. These committees are self-created, but care should be taken to have broad engagement with appropriate stakeholders. No one organization should control the committee, and stakeholders should feel equal ownership.

The 2030 District Charter outlines the responsibilities that the Sponsor Organization (i.e., the entity managing or supporting the 2030 District) must assume to be able to use the 2030 District trademark, and grants access to the resources and support of the 2030 Districts Network.

"Through District membership, building owners, property managers, and developers are given access to a suite of resources, tools and opportunities to improve and add value to their assets.

Phase 2:

Emerging 2030 District

An Emerging 2030 District is formed once the exploratory committee has active participation from a diverse set of property owners/managers and has substantive traction and support from local stakeholders. Once Phase 2 has been achieved, the district committee is given access to a package of district administration toolkits along with further consultation services from the Architecture 2030 staff.

Assessment of current building performance relative to 2030 District goals

Anonymous benchmarking against local peer buildings

Guidance for moving towards 2030 District goals

Training and ongoing support through educational workshops on tools and best practices

Innovative software platforms to track and analyze performance

In-kind member professional services and contributions, including project scoping and feasibility

Influence on District-related policy issues, including incentives

Bulk purchasing and project financing resources"¹³

Phase 3:

Established 2030 District

An Emerging 2030 District becomes an Established 2030 District when the exploratory committee has agreed on a formal organizational structure, generated a critical mass of commitments from property owners and managers, and signed the official 2030 District Charter with Architecture 2030.

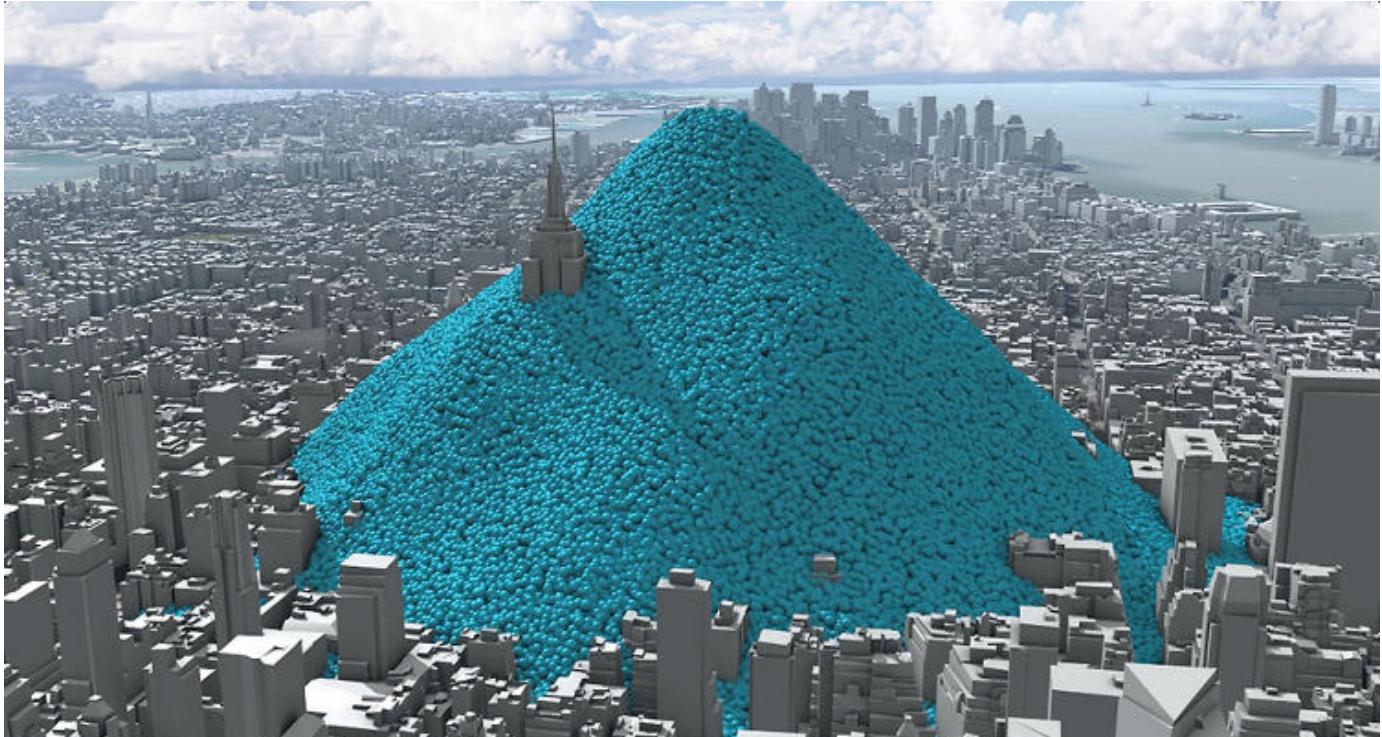


Figure 3: A depiction of one day's emissions of CO₂ from New York City.

All 2030 Districts benefit from the following partnerships, support, and services from the 2030 District Network:

Technical support and related services;

Strategies for cost-effective reductions in energy and water consumption, and commuter transportation approaches to reduce CO₂ emissions;

A 2030 District website with tools for editing and adding material;

A 2030 District Owner/Manager database;

Participation in 2030 District conference calls, summits, webinars, and capacity building workshops;

2030 District publications and other information;

Strategies and funding mechanisms for 2030 District staff;

A list of best practices for property owners and managers, and written and/or video content;

Assistance with data evaluation and the design of actual District-specific support services;

- A standardized toolkit to help cities create new Districts;
- A process for establishing District and building benchmarks;
- A benchmarking study of similar efforts and potential collaboration;
- Access to NationalField software to share best practices and increase collaboration¹⁴

2030 Districts can be supported by a variety of capital-sourcing methods including cost-sharing, grants, sponsorships, etc. Each District's fundraising strategies are determined by its structure and by the opportunities available in the region, city, or community where it is located. To ensure the greatest degree of success, the private and public sector partners collaborate on funding strategies and share risks and resources. Once stakeholders are organized and initial conversations and goals are underway, fundraising strategies can include the following:

- Cost-sharing / partnerships
- Volunteer time, donations, other contributions
- Grant funding
- Sponsorships
- Impact / service fees
- Subsidies

The 2030 District Network provides a range of templates and tools to assist in district management. As an example, the Performance Metrics Toolkit provides each District with the tools and resources for collecting, analyzing, and reporting building performance data. This helps to establish District baselines, aggregate and analyze building performance data, and produce reports charting progress for the overall district, individual portfolios and buildings.

In 2015, looking specifically to NYC, Edward Mazria of Architecture 2030 published a report titled "Achieving 80 by 50: Reducing Energy Use, Achieving Jobs, and Phasing Out Carbon Emissions in NYC Buildings." ¹⁵ A central point is that NYC "buildings are responsible for 71% of the city's greenhouse gas emissions (GHG) and 94% of its electricity consumption" and that the ideal time to address energy improvements is when buildings change hands. "There are about 26,000 buildings bought and sold in New York City each year, meaning approximately 900,000 buildings will change hands over the next 35 years."

The report advocates a series of regulatory revisions to raise building energy performance incrementally toward meeting the 80 by 50 goals. Included in the proposals is a recommendation for "voluntary stretch codes" to accelerate innovation and adoption of best practices in advance of mandated requirements. These proposed "stretch code" standards are to be coupled with zoning, financing and regulatory relief incentives. The report also emphasizes the prospective increase in jobs and tax receipts anticipated from the economic activity to be generated for the city by the plan.

ECODISTRICTS

Description of the EcoDistricts program

The EcoDistricts program began in 2009 as an initiative of the Portland Sustainability Institute (PoSI) in partnership with the City of Portland and has since expanded into a nationwide program. Rebranded from PoSI to EcoDistricts in 2014, the organization in Portland now provides support, guidance and convening opportunities for stakeholders across North America to explore launching EcoDistricts in their local communities. A methodology and framework called The EcoDistricts Protocol¹⁸ has been developed, and is now being field tested at emerging EcoDistricts in 16 cities across North America.

EcoDistricts offers a shared vision for accelerated growth of sustainable cities from the neighborhood up, following the EcoDistricts Protocol. EcoDistricts are dedicated to serving the growing number of innovative practitioners and policy makers who are improving local communities and helping to advance the global green movement. Fundamentally, the approach is an effort to deploy high-impact, district-scale sustainable projects that drive experimentation and adaptation. Pipeline projects are developed to reduce ecological footprints, promote community action and civic entrepreneurship,

generate green jobs, promote equity, and ultimately create neighborhoods that are resilient, vibrant, resource efficient and just. The scale of each EcoDistrict is itself an important factor in fostering sustainability and resilience, as it needs to be small enough to innovate quickly yet big enough to have a meaningful impact.¹⁷

EcoDistricts:

- ▶ Focus on place-based development typologies, including brownfields and major redevelopment, campus and neighborhood revitalization projects;
- ▶ Engage with plan makers and policy makers, community representatives, financiers, and developers;
- ▶ Use eight “Performance Areas” (listed below) across the full sustainability spectrum to inspire and guide sustainability project opportunities;
- ▶ Use a performance tool called the “EcoDistricts Protocol” that allow the districts to develop a road map for planning, designing, financing, delivering, and monitoring EcoDistrict projects.

The EcoDistricts Protocol is a set of commitments that are embraced to build just, sustainable and resilient cities and neighborhoods for all.



Figure 4: Process for organizing and operating an EcoDistrict

The Eight Performance Areas:

1. Equitable Development

Goal: Promote equity and opportunity and ensure fair distribution

Objectives:

1. Ensure neighborhood investments provide direct community benefit through job creation and investment opportunities
2. Provide quality and consistent local job opportunities through EcoDistrict projects
3. Mitigate the forced displacement of existing residents and businesses
4. Ensure diverse stakeholder involvement in all EcoDistrict activities and decision making

2. Health & Well Being

Goal: Promote human health and community well-being

Objectives:

1. Provide access to safe and functional local recreation and natural areas
2. Provide access to healthy, local and affordable food
3. Ensure safe and connected streets
4. Expand economic opportunities to support a socially and economically diverse population
5. Improve indoor and outdoor air quality

3. Community Identity

Goal: Create cohesive neighborhood identity through the built environment and a culture of community

Objectives:

1. Create beautiful, accessible and safe places that promote interaction and access
2. Foster social networks that are inclusive, flexible and cohesive
3. Develop local governance with the leadership and capacity to act on behalf of the neighborhood

4. Access & Mobility

Goal: Provide access to clean and affordable transportation options

Objectives:

1. Provide accessible services through mixed-uses and improved street access
2. Prioritize active transportation
3. Reduce vehicle miles traveled
4. Use low and zero emission vehicles

5. Energy

Goal: Achieve net zero energy usage annually

1. Conserve energy use by minimizing demand and maximizing conservation
2. Optimize infrastructure performance at all scales
3. Use renewable energy

6. Water

Goal: Meet both human and natural needs through reliable and affordable water management

Objectives:

1. Reduce water consumption through conservation
2. Reuse and recycle water resources wherever possible, using potable water only for potable needs
3. Manage stormwater and building water discharge within the district

7. Habitat & Ecosystem Function

Goal: Achieve healthy urban ecosystems that protect and regenerate

Objectives:

1. Protect and enhance local watersheds
2. Prioritize native and structurally diverse vegetation
3. Create habitat connectivity within and beyond the district
4. Avoid human-made hazards to wildlife and promote nature-friendly urban design

8. Materials Management

Goal: Zero waste and optimized materials management

Objectives:

1. Eliminate practices that produce waste wherever possible
2. Minimize use of virgin materials and minimize toxic chemicals in new products

3. Optimize material reuse and salvage, and encourage use of regionally manufactured products or parts
4. Where opportunities for waste prevention are limited, maximize use of products made with recycled content
5. Capture greatest residual value of organic wastes (including food) through energy recovery and/or composting

Each EcoDistrict establishes its own set of goals along with supporting programs to address those goals, and metrics to judge the success of those programs by. These goals are defined and programs developed during the District Organization and District Assessment phases. Programs are launched during the Project Feasibility and Development phase, and monitored according to the metrics developed during the District Management phase. Funding strategies vary greatly based on the type of host organization that the EcoDistrict is operating under. They may be newly created to run the district or through an existing organization taking on the role of the EcoDistrict champion.

ECODISTRICTS STRATEGIES¹⁸

EcoDistrict projects can take many forms, depending on the unique characteristics of a neighborhood and a community's priorities. Examples of potential projects include:

- Smart grid
- District energy and water management
- Bike sharing
- Rainwater harvesting
- Green streets
- Zero waste programs
- District composting
- Waste to energy
- Safe routes to schools
- Tree planting campaigns
- Transportation demand management
- Car sharing
- Bike lanes
- Sidewalk improvements
- Urban agriculture
- Public art
- Green maps
- Multi-modal transit

ECODISTRICTS OUTCOMES¹⁹

A framework and implementation strategy for cities to accelerate neighborhood sustainability

Implementation tools and strategies for governance, assessment, project finance and municipal policy adoptions

New business models and opportunities for neighborhood investment

High-impact projects such as district energy, green streets, smart grid, demand management and resource sharing

A municipal policy agenda with laws, incentives, and processes that support sustainable neighborhood development

Neighborhoods as laboratories for sustainability innovation

Examples of EcoDistrict programming:

Below are examples of programming from three existing EcoDistricts: Seattle Capitol Hill EcoDistrict, Lloyd EcoDistrict in Portland, and Washington DC Downtown EcoDistrict.

Seattle Capitol Hill EcoDistrict programming, either leading or in partnership:

Buildings:

Better Buildings Challenge: a Department of Energy (DOE) sponsored program developing energy efficiency goals at both the building and neighborhood scale.

Capitol Hill 2030: a partnership with Seattle 2030 to create strong metrics for building efficiency programs.

Pike Pine Conservation Overlay: working with local community groups to guide a City of Seattle possible rezoning overlay in the area.

Businesses:

Capitol Hill Saves!: a pilot program in partnership with the National Historic Trust's Preservation Green Lab to develop better energy efficiency programs for small commercial buildings.

Get on the Map, Capitol Hill: a partnership with Seattle Public Utilities Green Business Program, designed to conserve water, reduce waste and decrease pollutants entering the local waterways and aquifers.

Infrastructure:

Capitol Hills Arts District: a local partnership to keep artists' work and living spaces available and affordable in the Capitol Hill community.

Central Seattle Greenways: a partnership to bring safer streets, improved walkability and biking infrastructure to the Capitol Hill Community.

Community Solar: a partnership with local utility Seattle City Light and a multi-family complex in the neighborhood to bring clean power purchasing options to the community.

Dumpsters in the Right of Way: a partnership with the Capitol Hill Chamber of Commerce to study ways to reduce waste flows and control dumpster overflow in alleys.

Pike Pine District Shared Parking: a new parking management strategy in the neighborhood, an area with traditional and overstressed public parking.

Pike Pine Pedestrian Streets Pilot: leading a planning process to create safer streets.

Pollinator Pathway: helping develop a new greenway program.

Lloyd EcoDistrict Performance Goals

ENERGY

Reduce energy demand by 60%

- Conserve energy use by minimizing demand and maximizing conservation
- Optimize infrastructure performance at all scales
- Use renewable energy

WATER

Meet both human and natural needs through reliable and affordable water management

- Reduce water consumption through conservation
- Reuse and recycle water resources wherever possible, using potable water only for potable needs
- Manage stormwater and building water discharge within the district

MATERIALS MANAGEMENT

Zero waste and optimized materials management

- Eliminate practices that produce waste wherever possible
- Minimize use of virgin materials and minimize toxic chemicals in new products
- Optimize material reuse and salvage and encourage use of regionally manufactured products or parts
- Where opportunities for waste prevention are limited

maximize use of products made with recycled content

- Capture greatest residual value of organic wastes (including food) through energy recovery and/or composting

HABITAT + ECOSYSTEM FUNCTION

Achieve healthy urban ecosystems that protect and regenerate habitat and ecosystem function

- Protect and enhance local watersheds
- Prioritize native and structurally diverse vegetation
- Create habitat connectivity within and beyond the district
- Avoid human-made hazards to wildlife and promote nature friendly urban design

ACCESS + MOBILITY

Provide access to clean and affordable transportation options

- Provide accessible services through mixed-uses and improved street access
- Prioritize active transportation
- Reduce vehicle miles traveled
- Use low and zero emission vehicles

Figure 5:The Portland Lloyd EcoDistrict performance goals

People:

Capitol Hill Tool Library: a new sharing system for the community to loan and borrow tools and other items.

Resident Engagement & Leadership Development Program: a training program to help affordable housing and multi-family owners, managers and residents bring better efficiency programs into play.

Washington, DC Downtown EcoDistrict programs: Life in the DowntownDC EcoDistrict

"Picture this. In the morning, you grab a Capital Bikeshare bike to work, safely cruise down a dedicated bike lane separated from cars and head to your office. At your office, you find recycling bins at every printer and you hear about a new energy-efficient HVAC being installed. For lunch, you stop at a nearby farmers' market and bring your meal to Franklin Park to enjoy, recycling your soda bottle in the blue can on the corner as you finish."²⁰

EcoDistrict Goals:

Reduce peak and overall energy consumption

Enhance the economic performance, market positioning, and market share of Downtown buildings

Develop and promote DowntownDC as one of the most sustainable downtowns in the world

Programming in DowntownDC ecoDistrict:

Buildings

The BID²¹ is home to a record 99 LEED Certified projects, including two new platinum certified projects in 2013. The McPherson Building (901 15th Street NW) and the offices for the architecture and engineering firm SmithGroup (901 K Street NW) were awarded platinum certification and the D.C. Department of General Services (DGS) received gold certification of their rehab of the D.C. Court Building (410 E Street NW).

Energy improvements are being experienced across the BID. Thirty-seven office buildings within the DowntownDC ecoDistrict are local members of the Urban Land Institute (ULI) Greenprint Center alliance of real estate owners, investors and strategic partners committed to sustainability. This set of buildings reduced their energy usage by 4.8 percent from 2009 to 2012 and reduced their carbon emissions by 4.2 percent over the same period despite experiencing a 33 percent increase in the number of full-time employees.

Improved building sustainability furthers the goals of the DC Smarter Business Challenge, a

partnership established between the BID and the District Department of the Environment (DDOE) to help and support building owners and tenants in improving energy efficiency and saving money.

Transportation

Reducing DowntownDC's carbon footprint is part of the mission of the ecoDistrict, and promoting Downtown's multi-modal transportation helps accomplish that goal.

In 2012, 55 percent of D.C. commuters on average chose transportation other than a car for their commute: 41 percent used public transit, 13 percent walked and 4 percent biked to work, according to the American Community Survey. The Sustainable DC goal is to increase the number of non-automobile commuters to 75 percent in 2032 with 50 percent of commuters utilizing public transit, and 25 percent walking or biking.

The Capital Bikeshare system offers over 1800 bikes at more than 200 stations in the district and in nearby areas of Maryland and Virginia, and the BID is proud to have helped found what is today the current bikeshare program.

Transportation infrastructure improvements are a key element of the DowntownDC ecoDistrict program. In addition to bike sharing, bicycling in DowntownDC has been made easier by the availability of dedicated bike routes. The District Department of Transportation, in partnership with the BID, has increased the number of dedicated bike routes in Downtown and augmented them to provide safe and convenient routes as a means of encouraging sustainable transportation for workers, residents and visitors.

Healthy Communities

A major renovation plan for Franklin Park is currently underway, facilitated by the National Park Service (NPS), the Office of Planning, the D.C. Department of Parks and Recreation (DPR) and the BID. The public has been involved through each step of the planning process, contributing to a greater sense of community and extending the sustainability mission behind the park to a wider audience.

Simultaneously, the BID and the ecoDistrict are working to enliven the park with dynamic programming including "Workout Wednesdays" in the summer and "Picnics in Franklin Park" in the fall.

Overall, green space significantly contributes to the mission of sustainability. The BID serves as a "Canopy Keeper" for newly planted and one-year old trees adjacent to parks, and recruits property managers to do the same. This has increased the

number of living trees in tree pits in the BID. Canopy Keepers agree to care for and monitor specific trees.

The BID also supports efforts to enjoy outdoor green space in Downtown. By sponsoring the FRESHFARM Markets, which bring local farmers to Downtown as well as to other areas, the BID encourages sustainable living and promotes the use of outdoor space.

As can be seen by these very different sets of programs and goals that the three EcoDistricts have developed and employed, there is a good deal of flexibility in the EcoDistrict Protocol process to develop goals and programming that are appropriate for and specific to the particular community. This "flexibility by design" makes the EcoDistrict Protocol an ideal process for almost any type of community to engage with. It is by its nature a place-based and locally driven process.

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COMPARISON

2030 District & EcoDistrict programs

While there are many similarities between the 2030 District and EcoDistricts programs, there are also some significant differences as shown in the table following. A primary difference is that 2030 District goals are heavily focused on energy efficiency while EcoDistricts have a broader set of goals.

Mission statements, goals and strategies of the 2030 District and EcoDistricts programs :

	2030 District	EcoDistrict
Mission/ description	<p>2030 Districts are unique private/public partnerships committed to reducing energy use, water use, and transport emissions in designated urban areas across North America.</p> <p>2030 Districts bring property owners and managers together with local governments, businesses, and community stakeholders to provide a business model for urban sustainability through collaboration, leveraged financing, and shared resources. Together they benchmark, develop and implement creative strategies, best practices and verification methods for measuring progress toward a common goal.</p>	<p>EcoDistricts are neighborhoods or districts where neighbors, community institutions and businesses join with city leaders and utility providers to meet ambitious sustainability goals and co-develop innovative district-scale projects.</p> <p>The EcoDistricts approach is a comprehensive strategy to accelerate sustainable development at the neighborhood scale by integrating building and infrastructure projects with community and individual action. They are an important scale to accelerate sustainability – small enough to innovate quickly and big enough to have a meaningful impact.</p>

Focus²²	<p>High performance buildings and building retrofits</p> <p>Engaging with individual building owners and managers, building sector professionals, and community representatives, and is private sector led</p> <p>Tracking metrics and performance in the following areas: building energy and water use, and transportation emissions</p> <p>Reporting on aggregated building and district wide performance against set metrics and performance goals with incremental milestones</p>	<p>Focused on place-based development typologies, including brownfield and major redevelopment, campus and neighborhood revitalization projects</p> <p>Engaging with plan makers and policy makers, community representatives, financiers, and developers</p> <p>Uses eight "Performance Areas" across the full sustainability spectrum to inspire and guide sustainability project opportunities</p> <p>Uses a performance tool called the "EcoDistricts Framework" to allow projects to develop a roadmap for planning, designing, financing, delivering, and monitoring EcoDistrict projects</p>
Strategies	<p>Developing and operating high performance buildings by transforming the way buildings are designed, constructed, and maintained</p> <p>Aggregating resources and collaborative action</p> <p>Advocating for sustainable policies</p>	<p>Improving sustainability performance through green building, smart infrastructure, behavior and choice (public awareness)</p> <p>5 Phases</p> <ul style="list-style-type: none"> District Organization District Assessment Project Feasibility Project Development District Monitoring

Stakeholders	Building owners, managers and developers, and architecture, engineering and building services professionals; community stakeholders; nongovernmental, non-profit and professional organizations and states and local governments	Neighborhood stakeholders, property developers, utilities and municipalities
Financing	2030 Districts are organized differently in each city. In those cities where the district is sponsored by a host organization, it may provide financial support. Other districts seek dues from service firms for the benefits of generating opportunities and access to 2030 member property owners. Districts may be awarded sustainability grants, or earn fees for services to public agencies or corporations for facilitating public outreach, renewable energy or building retrofit programs.	There are three primary categories that require funding: district organization and staffing, feasibility and small-scale project development; district utilities; and large-scale project development. The EcoDistrict Financing Toolkit describes the range of financing options to support these three categories and offers related case studies. It catalogs public and private funding streams, explores potential new funding mechanisms and outlines strategies to blend various types of funding sources to finance projects.

District establishment process	<p>Phase 1: A Prospective 2030 District is formed by establishing an exploratory committee.</p> <p>Phase 2: An Emerging 2030 District is formed once the exploratory committee has active participation from a diverse set of property owners/managers and has substantive traction and support from local stakeholders.</p> <p>Phase 3: An Emerging 2030 District becomes an Established 2030 District when the exploratory committee has agreed on a formal organizational structure, generated a critical mass of commitments from property owners and managers, and has signed the official 2030 Districts Charter with Architecture 2030.</p>	<p>An initial Stakeholder Committee is formed in the prospective EcoDistrict community. There should be one lead organization hosting and pushing the early process forward, and that lead organization can take many forms: city planning agency, business improvement district, community housing organization, academic institution, private sector developer, etc.</p> <p>This Stakeholder Committee identifies needs and opportunities in the district, hosts community based planning charrettes and goal-setting workshops, and seeks early seed funding. Once the funding is secured, one or more permanent staff is brought on to lead the next steps in the EcoDistrict Protocol Process.</p>
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DESCRIPTIONS

Selected 2030 Districts and EcoDistricts

In this section, selected districts in each of the 2030 District and EcoDistrict programs are described in more depth. The districts were chosen both for their diversity and, in some cases, for the fact that there are both types of districts in the same city.

As part of the research for this section, interviews with staff members of each of the districts were conducted. A list of the interviews can be found in Appendix E.

2030 DISTRICTS

Four 2030 Districts were analyzed for the purposes of this research paper:

- Seattle
- San Francisco
- Pittsburgh
- Stamford

There are six additional 2030 Districts across North America, and others, including New York City, are in various stages of development.

Some of the material in this section derives from interviews with 2030 District leaders from the subject districts. See Appendix E for interview details.



Seattle 2030 District²³

About:

The Seattle 2030 District was established in 2011 by Brian Geller, who was its first Executive Director. EPA gave seed funding for the district, which subsequently represented Seattle in the Better Buildings Challenge. The district is a privately led, voluntary membership organization and does not require the participation of any government entity. The City of Seattle supports the organization's energy, water and transportation goals and, to that aim, has joined the district as a Community Stakeholder, as well as a Property Owner and Manager member.

Separate from the pro-bono services offered by the district, the City of Seattle is offering a limited pilot program for expedited permitting, which is above and beyond current expedited programs, for projects meeting the performance goals of the district.

The Board of Directors consists of 9 property owners, 6 professional stakeholders and 6 community stakeholders.

Boundary:

The boundary currently includes the downtown core, South Lake Union, and portions of First Hill and Capitol Hill. It was initially set around the founding member property owners and managers. It can be expanded to accommodate new members, but it is meant to remain within Seattle's dense, center-city neighborhoods. A total of 133 buildings, representing 38 million sq. ft. have joined since 2011.

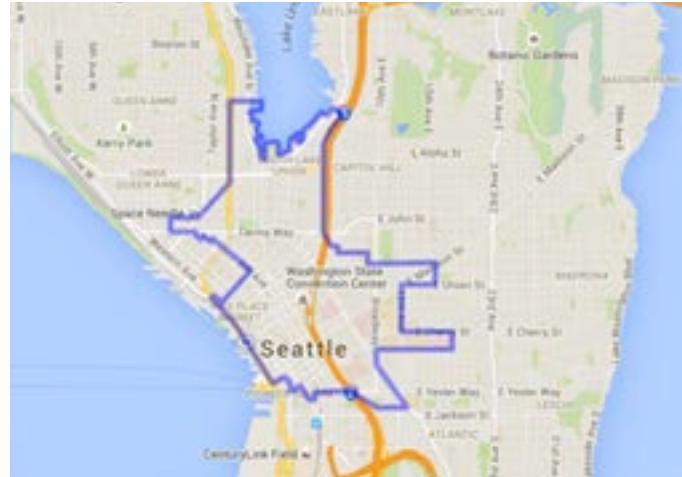


Figure 6. Boundaries of Seattle 2030 District

Members:

There are 43 property owners/managers, such as CBRE, Belwether Housing and Seattle University; 42 professional stakeholders, such as ZFG Architects, 2020 Engineering and Capital Review Group; and 17 community stakeholders, including the Clinton Climate Initiative and Cascadia Region Building Council. Its supporters include Milepost Consulting, Seattle Steam and Unico Properties. There are currently no fees associated with membership. Members, however, are required to participate in a minimum of two task force meetings per year to maintain membership status.

Performance Baselines:

The energy reduction baseline is set by Energy Star and the water baseline is based on actual consumption within the Seattle 2030 District boundary. Transportation baselines are derived from commuter trip data provided by Commute Seattle. Data are only viewed by Seattle 2030 District Staff and Architecture 2030, and are not shared with the City of Seattle or with other district members.

Progress:

As of October 2014, buildings shared by a common owner within the district saw reductions of 19% in energy use, 6% in water use and 6% in transportation emissions. The total district has witnessed reductions of 7% in energy use, 2% in water use and an impressive 9% in transportation emissions.

Several large property owners in Capitol Hill have joined the Seattle 2030 District, and the Capitol Hill EcoDistrict (see EcoDistrict section) has adopted 2030 Challenge targets for energy, water and transportation.

The Seattle 2030 District has seen significant reductions in resource use and is collaborating with the neighboring Capitol Hill EcoDistrict to further improve building energy performance.

San Francisco 2030 District²⁴

About:

The San Francisco 2030 District is a public-private-nonprofit collaborative in downtown San Francisco, bringing together design professionals, building managers, energy, I.T. and sustainability experts. It was officially launched on December 5, 2014. The district's director is Stan Lew of the San Francisco-based RMW architecture & interiors. It was formed by volunteer professionals and is hosted by the NFP Architectural Foundation: an educational group that places high school interns in architectural firms. The San Francisco Department of the Environment and Division of Real Estate support the San Francisco 2030 District.

Boundary:

There are over 9 million sq. ft. inside the central business district of San Francisco, roughly bounded by Washington Street to the north, Van Ness Avenue to the west, 7th and King Street to the south, and around the Embarcadero.

Members:

There are 8 property owner/managers including Bentall Kennedy, Cushman & Wakefield, JLL and Kilroy Realty; 11 professional stakeholders including Bayer, Code Green Solutions, Glumac and NBBJ; and 6 community stakeholders including the American Institute of Architects, Architectural Foundation of San Francisco, and Investor Confidence Project, a project of the Environmental Defense Fund.

The funder is Gensler, which is also a professional stakeholder.

Goals:

The volunteer leadership proposed that the stakeholders could accomplish "more if we work together." Their objectives are to access 2030 Network bulk purchasing, pilot new technologies and develop prospective partnerships with Silicon Valley.

Their primary goals are to become a test bed for new technologies, a Pacific Gas and Electric Pilot to save energy and a virtual district model with City Zenith.

Future Plans:

There is potential for 120 million square feet. The district is seeking sponsorships and collaborative projects with tech firms, utilities, and building operations and management firms.

The San Francisco 2030 District and the city's Departments of Planning and Environment are exploring collaborative efforts with the SoMa EcoDistrict.

Pittsburgh 2030 District²⁵

About:

The Pittsburgh 2030 District, launched in 2013 in Downtown Pittsburgh, is a collaborative, nationally recognized partnership of local communities of high performance buildings in Downtown and Oakland. It is a strategic initiative of the Green Building Alliance. In 2014, the Pittsburgh 2030 District, initially in downtown, officially expanded into the Oakland neighborhood of Pittsburgh, making it the first 2030 District in the nation to have two distinct sub-boundaries.

Boundary:

The district includes the Central Business District, North Shore, and the Lower Hill redevelopment site. It represents nearly seventy percent of the total real estate square footage in downtown Pittsburgh and Oakland. Downtown Pittsburgh provides not only high visibility

and focus for the Pittsburgh 2030 District, but is a national identifier for Pittsburgh. By initially focusing on a concentrated geographic area (which includes the city and county government, small and large businesses, and universities), the Pittsburgh 2030 District has been able to engage a significant number of buildings and amount of square footage in a short period of time, thus demonstrating to others -- locally, regionally, and nationally -- that achieving district goals is possible, feasible, and a smart business decision.

Members:

There are 73 Property Owner/Managers, including Henderson Brothers, Carnegie Mellon University and 808 Penn Lofts; 12 Professional Stakeholders including Mascaro Construction, Colliers International and Stantec;



Figure 7 : Boundaries of Pittsburgh 2030 Districts.

28 Community Stakeholders including The Oakland Task Force, RiverLife and Bike Pittsburgh; and 8 Resource Partners including Encetive Energy and Enerlogics. The funders are Pittsburgh Foundation, Kresge Foundation, Heinz Endowments, Richard King Mellon Foundation and U.S. Department of Energy.

Progress:

As of 2014, 436 buildings representing over 65 million square feet in Downtown and Oakland have committed to the district goals. Ninety-five percent of committed properties are voluntarily reporting their water and energy usage to Green Building Alliance. The district has achieved a 6.3% reduction in energy use below baseline, rapidly approaching the incremental 2030 Challenge goal of 10% reductions by the end of 2015. There has been a 10% reduction in water use in Downtown. (Oakland's water baseline is in development.)

Importantly, four Pittsburgh 2030 District Property Partners opted to voluntarily publicly disclose their buildings' energy performance: Allegheny County, the City of Pittsburgh, the Stadium Authority of Pittsburgh, and the Sports & Exhibition Authority of Pittsburgh and Allegheny County.

Future goals:

The district-wide opportunity is to ultimately reach 96.6 million square feet (100% of Downtown and Oakland). The city wishes to join Pittsburgh's EcoDistrict with the 2030 District for possible collaboration on environmental, stormwater, social and economic development issues.

The district has achieved a 6.3% reduction in energy use below baseline, rapidly approaching the incremental 2030 Challenge goal of 10% reductions by the end of 2015. There has been a 10% reduction in water use in Downtown.

Stamford 2030 District²⁶

About:

The Stamford 2030 District was established by the Business Council of Fairfield County and the not-for-profit CT Fund for the Environment (CFE), organizations which had previously worked together. The research began in 2013 when they looked at different types of programs before settling on a 2030 District because it had the benefit of a national network and recognition. Launched in October 2014, Stamford's 2030 District became the sixth in the United States.

Goals:

The goals are the same as most 2030 districts: energy, water and transportation reduction. This district has also added resiliency as a goal since, after Superstorm Sandy and recent storms, the building owners recognized it as an important issue. The district may refine the Architecture 2030 standards and measurements to make them appropriate for Stamford.

Some of the Stamford district's primary programs consist of sharing best practices and learning about specific topics. In the past they have conducted:

- A benchmarking webinar with WegoWise to explain the process to building owners;
- Two workshops on the C-PACE program with the CT Green Bank focusing on non-profits, faith community, and multi-family housing;
- A workshop on resiliency with IBM/AECOM to assess the city using the UNISDR Disaster Resilience Scorecard; and
- An Experience Electric Car event to talk about new technologies.

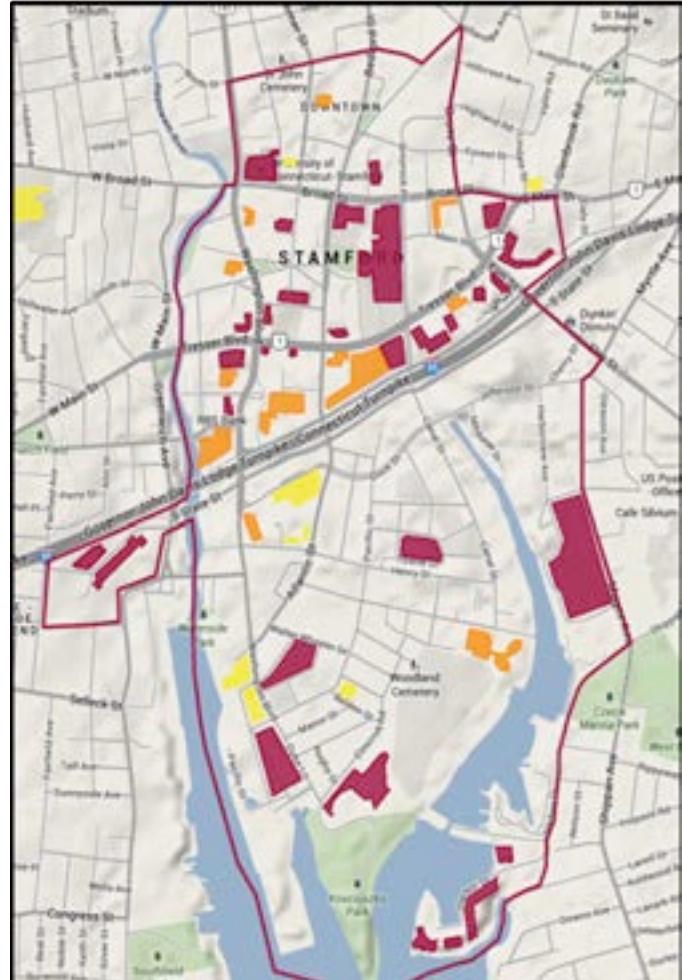


Figure 8: Boundary of Stamford 2030 District

Boundary:

The boundary is the same as Stamford Energy Improvement District (which was set up about 8 years ago). There are 18M square feet of commercial office in downtown Stamford.

The goal is to expand beyond the downtown core and incorporate a larger area. There are other Connecticut cities interested as well.

Organizational Structure:

There is an advisory board but no board of directors yet. It is currently working under CFE's non-profit status. Establishing a 501(c)(3) is a long term goal.

There is one full-time staff member, assisted by part-time staff from collaborating organizations. They are expecting to hire another staff member.

Members:

There are 14 Property Owners/Managers including CBRE, Ashford Company, Ferguson Library and New Neighborhoods; 8 Professional Stakeholders including Deloitte, Steven Winter Associates and Eversource Energy; and 10 Community Stakeholders including CT Green Bank, SoundWaters and Sustainable America. The four funders are: Emily Hall Tremaine Foundation, Partners for Places, The John Merck Fund and Kresge Foundation. It is mandated that 40% of the membership be composed of building owners. The city government is a building owner, but essentially a community supporter as well.

The district had planned on setting a one-year goal of signing 10 members, but exceeded that goal with 23. They now have 32 members and the long term goal is to reach 50.

Budget:

The initial funding was provided by Emily Hall Tremaine Foundation, Partners for Places, John Merck Fund and Kresge Foundation. The district charges some fees for service funding and solicits sponsorships for meetings

(through logos on materials, reserved seats at events, etc). In May 2015, they were awarded a grant from Partners for Places (a project of the Funders' Network for Smart Growth and Livable Communities) and the Emily Hall Tremaine Foundation.

The Stamford 2030 District is working to create a structure of self-sufficiency through business contributions, memberships and events.



EXISTING ECODISTRICTS

The following four existing EcoDistricts have been selected for analysis because they best represent the most relevant approaches for EcoDistrict establishment in NYC.

San Francisco SoMa (local government initiated)

Kendall Square, Cambridge, MA (private developer initiated)

DowntownDC (Business Improvement District initiated)

Seattle Capitol Hill (Affordable Housing Authority/CDC initiated)

There are 16 other EcoDistricts across North America in various stages of development.

Some of the material in this section derives from interviews with EcoDistrict leaders from the subject districts. See Appendix E for list of interviews.

San Francisco Central SoMA EcoDistrict²⁷

About:

The City of San Francisco is creating an EcoDistrict pilot in the Central SoMa plan area to encourage innovative district-scale sustainable development projects in an important part of the city slated for major reinvestment over the coming 10-20 years.

Boundary:

The Central SoMa Plan Area is a 24 square block area south of Market Street, from Market Street to Townsend and from 2nd Street to 6th Street, that notably includes the CalTrain station, a freeway and the Moscone Convention Center. This once-industrial area is now positioned to become a growing center of the city's and region's high-tech industry.

Formation:

In November 2011, the SF Planning Department assembled staff from city departments including SF Public Utilities Commission's water, wastewater and power divisions, SF Environment, and the Department of Public Works to find ways to meet established city environmental goals while accommodating planned growth.

The Planning Department identified the Central SoMA area as a "Type 2 Eco-District": a patchwork quilt, characterized by its mix of land uses and composed of undeveloped, underdeveloped, and developed land owned by property owners implementing development projects under different timeframes.

The plan proposes to build upon the neighborhood's success while addressing many of its challenges with a comprehensive strategy that will address such issues as land use, building sizes and heights, transportation, the public realm (including sidewalks and open space), preservation of historic buildings, and environmental sustainability. These proposed changes are based on a synthesis of community input, past and current land use efforts, and analysis of long-range regional, citywide, and neighborhood needs.



Figure 9. Boundary of the San Francisco Central SoMA EcoDistrict

In June 2013, the SF Planning Department convened a task force as a means to engage key public and private stakeholders in collaborating and advising the project during the first phase of Central SoMA EcoDistrict development: the district organization phase. Specific objectives for the task force included:

- Establishing shared short and long term goals
- Identifying potential sustainability projects appropriate for Central SoMa
- Identifying potential implementation measures
- Exploring partnership structures to provide both short term and long term oversight and management

Organizational/Governance structure:

The Central SoMa EcoDistrict formation task force is composed of approximately 30 stakeholders representing public agencies and private organizations including city agencies, utility providers, neighborhood groups, non-profits, property managers, real-estate developers, architects, engineers and designers.

Because EcoDistrict projects have not yet been formally proposed for implementation, the district has not officially determined what type of organization would be best suited to manage them. Based on the analysis of oversight structures so far, a non-profit is considered at this time to be the most appropriate organizational entity.

Goals & Programs:

In a 2013 report, task forces provided recommendations and implementation strategies for nine performance areas:

- Equitable Development
- Economic Development
- Community Building
- Energy
- Water
- Materials Management
- Habitat & Eco-System Function
- Access & Mobility
- Health & Well-Being

[Since reduced to five strategies, per interview.]

Public Outreach & Engagement:

The April 2013 Central Corridor Plan Draft for Public Review²⁸ is the result of the input received from hundreds of community members and interested stakeholders. The SF Planning Department proactively reached out to stakeholder groups, and offered a wide variety of methods for engagement and providing input including:

- Meeting with community groups
- Walking tours
- Storefront charrette
- Community survey
- Public meetings
- Public hearings

The Central Corridor Plan Draft for Public Review conveys the extent of proposed changes to zoning, height limits, and the public realm (streets and open space).

Budget, staff and Funding:

Development in Central SoMa will generate a variety of public revenues (e.g. property taxes, sales taxes, real estate transfer taxes) to support proposed capital and program improvements in the Plan Area. The Central SoMa Plan proposes to apply a development impact fee program similar to the one used in the Eastern Neighborhoods. Based on draft fee levels, development is projected to generate approximately \$130-200M towards public realm, open space, and community facilities within the Plan Area. Certain EcoDistrict projects that were recommended by the task force are specifically intended to augment streetscape and open space improvements proposed in the draft Central SoMa Plan. The Planning Department will implement these projects to the extent that it is feasible under various implementation programs and the public revenue that will be generated by new development. Nevertheless, many EcoDistrict projects will not be funded through the development impact fee established by the Plan, but rather will require new funding vehicles for implementation.

Because financing and partnerships options will vary depending on the type and scope of the project, these cannot be determined at this time, although the Task Force did consider a spectrum of alternatives that could be used to support a variety of projects:

Mello Roos (Community Facilities District):
Landowners and residents within a prescribed boundary can vote (2/3rds required) to create a tax surcharge to support investment in public infrastructure and to support operating costs of public services.

Special Assessment District:

The Board of Supervisors can create a district in which an assessment is tied to a public benefit to be created from that assessment. While not as flexible in their structure as Mello Roos, they have been used extensively in California to support public infrastructure development.

Certificates of Participation:

These are asset-backed bonds issued by the city and county for public purposes.

Infrastructure Financing District:

This permits the utilization of future growth in assessed value to be used to support debt issuance or operating costs for public purposes within a specific boundary.

501(c)(3) Bonds:

Non-profits are authorized to issue tax-exempt debt.

General Obligation Bonds:

These are the city's highest form of credit and, as such, are typically only used for the highest priority projects.

Progress:

The Central SoMa EcoDistrict is still in the first phase of EcoDistrict development, the District Organization phase.



Figure 9. Conceptual Imagery - San Francisco EcoDistricts

Cambridge, MA

Kendall Square EcoDistrict²⁹

About:

Kendall Square is one of nine projects across seven North American cities that are a part of EcoDistrict Target Cities, a two-year program designed to amplify and accelerate sustainability at the neighborhood-scale.

Kendall Square is a commercial neighborhood with a large commuter population and a mix of transportation modes. The City of Cambridge, Kendall Square Association (KSA) and Massachusetts Institute of Technology (MIT) each have a direct and mutual interest in the current and future health and well-being of the Kendall Square neighborhood. Over the past 30 years, the neighborhood has grown from an austere and underutilized commercial district to a bustling, transit-oriented, mixed-use neighborhood that is internationally renowned for biotech and other innovation industries.

Formation:

During the 2013 EcoDistricts Incubator in May, the team (three individuals) met with sustainability leaders, was trained in the EcoDistricts framework and implementation tools, and drafted a strategic roadmap for Kendall Square.

Organizational/Governance structure:

The Kendall Square EcoDistrict is a volunteer group of individuals who are working together to develop an EcoDistrict in the Kendall Square neighborhood. This volunteer group represents Kendall Square property owners and organizations including Alexandria Real Estate Equities, BioGen Idec, BioMed Realty Trust, Boston Properties, the Cambridge Redevelopment Authority,



Figure 10: Boundary of Kendall Square EcoDistrict

the City of Cambridge, Draper Laboratory, the KSA, MIT, Massachusetts Institute of Technology Investment Management Company and Volpe National Transportation Systems Center.

Goals & Programs:

A primary goal is accelerated sustainable development at the neighborhood scale.

An EcoDistrict naturally fits this dynamic environment, building on existing vitality and momentum for change. Those who live and work in Kendall Square have already made great strides toward sustainability, particularly by reducing car traffic while increasing development.

But there are still significant opportunities, most notably through energy efficiency and smarter energy systems. Kendall Square is a dense neighborhood that hosts important educational, economic and research activities, which all require energy.

Another goal for the Kendall Square EcoDistrict, identified during the Incubator, is to increase transit capacity. Given the neighborhood's continuing growth and Massachusetts Bay Transportation Authority's transit limitations, designing strategies to meet Kendall Square's mobility needs without adding cars to the street is another key element for sustainability. Not only does this help reduce emissions, it also promotes a safe, lively, retail-friendly environment.

Finally, there are opportunities to generate more community interaction and use of public space.

Partnerships:

Kendall Square EcoDistrict would nest under the Community Compact for a Sustainable Future.³⁰ Both would benefit from a two-way exchange of information and ideas, where the Compact takes a broader, city-wide focus, utilizing partnerships and

collaboration to address climate change and other sustainability matters across the entire city of Cambridge, and the EcoDistrict model would operate on a fine-tuned, neighborhood scale, recognizing highly local conditions and priorities for sustainability.

Progress/Stage:
The district is in the early framework stage.

Washington D.C. DowntownDC EcoDistrict³¹

About:

The DowntownDC Business Improvement District (BID) is a private non-profit organization that provides capital improvements, resources and research to help diversify the economy and enhance the Downtown experience for all. The entire 138-block area of the BID, which stretches west from 16th Street to Louisiana Avenue on the east and from Massachusetts Avenue on the north to Constitution Avenue on the south, was designated by the BID as an EcoDistrict in 2011 as part of an effort to enhance living, working and visiting Downtown, and offer a boost to business and property owners.

Formation/Organizational/Governance structure:

The non-profit BID relies upon partnerships with the District of Columbia government, the Federal government (especially the General Services Administration through their Good Neighbor Program, which actively supports urban development through community partnerships), the National Park Service, and the National Capital Planning Commission, as well as the Washington Metropolitan Area Transportation Authority and a variety of other public agencies and private sector organizations.

Goals:

Reduce peak and overall energy consumption

Enhance the economic performance, market positioning, and market share of Downtown buildings

Develop and promote DowntownDC as one of the most sustainable downtowns in the world.



Figure 11: Boundary of DowntownDC EcoDistrict

Programs:

Green Infrastructure - The BID has cataloged existing green spaces within its 138-block area and is now attempting to identify opportunities to create new green infrastructure as well as expand upon existing projects.

Healthy Communities Initiative - Downtown offers a daily range of healthy options for residents, workers and visitors ranging from protected bike lanes to farmers' markets, recycling programs and free outdoor workouts.

Public Recycling Program - Thanks to a DowntownDC BID-PepsiCo partnership, 363 new recycling bins began appearing on Downtown streets in March of 2011.

Smarter Business Challenge - Presented in Fall 2015, the DC Smarter Business Challenge³² helps building owners and tenants continually improve the energy efficiency and

other business operations in their buildings or businesses while saving money.

Partnerships:

DowntownDC and The ULI Greenprint Center have co-authored the Metro Washington, D.C., Office Building Performance Report.³³ This report offers a glimpse of the analysis that is possible for the metro Washington, D.C. real estate market and is the starting point to examine trends and opportunities specific to office properties in metro Washington.

Budget, staff and funding:

Property owners fund this special district through tax assessments that enable the DowntownDC BID to improve the public realm and to promote and help retain businesses.

The Downtown BID employs 130 staff, 83 of whom are safety, hospitality and maintenance workers, known as SAMs, who keep Downtown streets clean, safe and friendly, and assist residents, workers and visitors with a variety of needs.

Progress:

In the three years since the creation of the EcoDistrict, sustainability has become an integral part of the DowntownDC community, which is now home to award-winning LEED certified buildings, park revitalization, a record-breaking bike share system and more. The Environmental Protection Agency recognized Washington, D.C. as the city with the most Energy Star certified buildings in 2014.

Seattle, WA

Capitol Hill EcoDistrict³⁴

About:

The Capitol Hill EcoDistrict is a neighborhood-based sustainability initiative serving the most densely populated urban village in the Pacific Northwest. It is led by Capitol Hill Housing(CHH), a community development corporation and public development authority with nearly four decades of experience working alongside Capitol Hill stakeholders to enhance community health and affordability.

Formation:

Three working groups formed under the aegis of the Steering Committee to address the following:

Land Use and Development:

How to get ahead of the next wave of development on Capitol Hill to help ensure that it serves the best interests of the neighborhood?

Equity and Engagement:

Who is missing from the table for big decisions affecting the EcoDistrict and how can it be more inclusive, especially of historically underrepresented people?

Waste and Human Behavior:

How to inspire and engage apartment dwellers to decrease the amount of waste going to the landfill?



Figure 12: Boundary of Seattle Capitol Hill EcoDistrict

Metrics:

Throughout 2014, CHH worked with a task force of community members and technical experts to identify key performance metrics, collect data to establish baselines and develop a reporting system to share progress over time. This process also included review by the University of Washington's Cities Collaboratory, and feedback from an interdepartmental group of City of Seattle staff.

The performance areas for metrics³⁵ are:

- Water
- Energy
- Habitat
- Culture
- Health
- Equity
- Transportation
- Material

Projects & Partnerships:

Community Solar: Capitol Hill Housing (CHH) partnered with Seattle City Light to host the first Community Solar project on an affordable housing building in the State of Washington.

District Shared Parking: a system under which parking can be leased across buildings.

Pollinator Pathway: a public design initiative founded by Sarah Bergmann that connects isolated landscape fragments with well-designed public projects.

Capitol Hill Arts District: Capitol Hill is recognized as a center for the arts and artists in Seattle, as it has been for half a century. Yet there is no formal collaborative model for the organizations, and the neighborhood has not been described as a theater or arts district. At the same time, this neighborhood is experiencing rapid change and gentrification. The existing arts organizations are

under real threat of being displaced by rising rents and redevelopment. Capitol Hill is increasingly perceived as being in danger of losing its soul. This cultural problem needs a cultural solution.

Capitol Hill 2030: The Capitol Hill EcoDistrict and the Seattle 2030 District have joined forces to support owners and managers in improving the performance of buildings on Capitol Hill. Together, they equip building owners and managers with tools to measure and track the performance of their commercial or multifamily properties and improve them to meet ambitious energy, water and carbon reduction targets.

Some large property owners and managers in the EcoDistrict have joined the Seattle 2030 District. The biggest new member to join in 2014 was Seattle Central College, adding 1.2M square feet to the District. Other active members include Seattle University, Capitol Hill Housing, Bellwether Housing and Hunter's Capital.

Progress:

In December 2014, they launched the EcoDistrict Index 1.0, a set of indicators to track neighborhood progress toward achieving sustainability targets in the EcoDistrict.

On January 27th 2015, the Seattle City Council passed a resolution formally recognizing the Capitol Hill EcoDistrict "for advancing City sustainability goals within the EcoDistrict boundaries."



Part 2:

How NYC Sustainability Districts Can Complement Other Programs

This section begins with research into existing sustainability programs and initiatives available in the New York City area. This is followed by a look into how 2030 Districts and Eco Districts in NYC would help move some of these programs' goals further, both more quickly and efficiently.

As businesses seek to occupy a particular niche and public agencies focus on addressing a specific objective, there are not many organizations working to coordinate the disparate resources available from the private and public sector in order to achieve broad community benefits. Sustainability districts, on the other hand, are composed of stakeholders who collaborate to maximize the positive outcomes from available investments and resources, as well as the inherent strengths of citizens and community organizations. They utilize a small management

team that administers the district and works with stakeholders, public and private sector organizations, and a range of professionals to identify synergies and assemble economies of scale to enable the implementation of high performance projects.

The following summary of programs indicates the range of resources that government, non-profits and corporations provide to meet sustainability and resilience goals. The service and finance sectors sell additional resources in the marketplace. All are made available to individuals, properties or institutions separately, often in a very inefficient manner. A major reason sustainability districts are established is to facilitate comprehensive solutions by aggregating resources and delivering complementary combinations of programs and services.

OVERVIEW

of existing programs

There is a plethora of programs and initiatives organized, sponsored or both by a wide range of types of groups: governing authorities, private sector, utilities, foundations and non-profits. There are also sustainability reporting programs, incubators and test beds. This assortment of programs can become very confusing and, at times, overlapping. The application for and implementation of these programs, along with the associated paperwork, by already strained businesses and property managers may be onerous and unappealing. This, in turn, leads to a scenario in which many of the programs languish and fail to achieve their goals. Thus neither the intended beneficiaries of the programs nor the programs themselves fulfill their potential.

One of the primary purposes of sustainability districts is to aggregate and integrate the many programs and initiatives to make it simpler for stakeholders in a district to work with or take advantage of these programs. District staff, who will be familiar with the range and specifics of these programs, will assist stakeholders – individually or aggregated – in utilizing the programs.

One clear gap which the sustainability district can address is the divide between sustainability and resilience objectives that are currently housed in separate silos. For example, programs that support renewable energy are geared toward lowering peak electrical demand while emergency power programs devoted to disaster

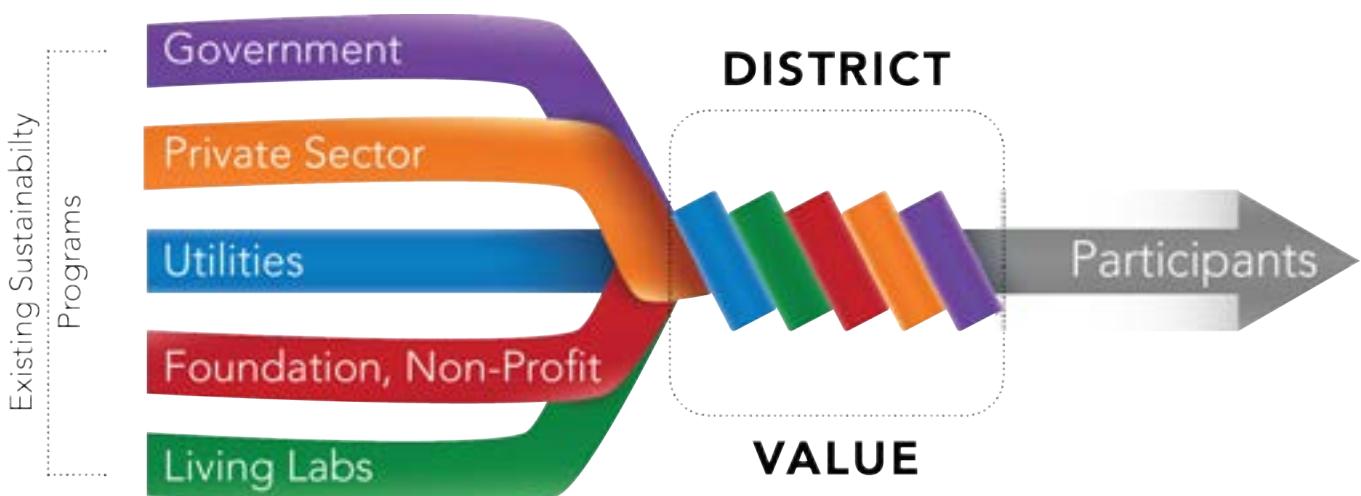


Figure 13: Diagram indicating how existing programs can enhance districts model

preparedness are isolated from each other even though both programs may utilize a common energy storage and network facility.

The community orientation of the sustainability district will lead to composite solutions which can address both of these objectives together. Potential synergies exist in many other areas such as waste-stream reduction, urban agriculture and storm overflow prevention. Technical and regulatory obstacles may be overcome at district scale to design and demonstrate replicable solutions.

This section is a synopsis of some of the programs, organized by type. A more complete list of applicable programs, along with descriptions, is found in Appendix A.

NYS/NYC GOVERNMENT LED INITIATIVES & PROGRAMS

PlaNYC

One New York

80x50 (One City Built to Last)

NYC Retrofit Accelerator

Greener, Greater Buildings Plan (GGBP):

Local Laws:

LL84 - Benchmarking

LL85 - NYC Energy Code (NYCECC)

LL86 - LEED Law

LL87 - Energy Audits & Retro Commissioning

LL88 - Lighting & Sub-Metering

Financing:

NYC Energy Efficiency Corporation (NYCEEC)

Tax Incentives:

Photovoltaics (PV)

Green Roofs

Outreach & Training:

Greening the City Codes

Regulations

The NYC Carbon Challenge

NYSERDA:

NY Prize

New Construction Program

Existing Facilities Program

Multi-Family Performance Program

CHP Programs (sm/lg systems)

Demand Management Program

NY Sun (PV)

Industrial and Process Efficiency Program

NY Green Bank

Reforming the Energy Vision (REV)

NYC Solar Empowerment Zones / Strategic Zones

NYC Green Schools

NYC DOE Sustainability Initiative

High Performance Building Guidelines
(NYC DDC)

DCAS Energy Management

Next Generation (part of Mayor de Blasio's
affordable housing plan)

US DOE - Energy Efficiency and Renewable
Energy

Sustainable Communities

PRIVATE SECTOR PROGRAMS

Sustainable Cities Initiative - Siemens
The Smarter Cities Challenge - IBM

UTILITY PROGRAMS

Con Edison - Utility Incentives, Rebates
National Grid - Energy Efficiency Rebates;
 Residential Gas
Con Edison / Think Eco - Cool NYC

FOUNDATIONS, NON-PROFIT INITIATIVES & PROGRAMS

C40 Cities
Sustainable Cities - Bloomberg Philanthropies
Clinton Climate Initiative - Energy Efficiency
Connect - Living Cities
City Accelerator - Living Cities / Citi Foundation
Sustainable Urban Mobility, Traffic Reduction, Cycling and Walking - Institute for Transportation & Development Policy / Embarq
Ross Center for Sustainable Cities - World Resource Institute
100 Resilient Cities Challenge - Rockefeller Foundation
Database of State Incentives for Renewables & Efficiency (DSIRE)
Building Energy Exchange (BEE)

SUSTAINABILITY REPORTING / CERTIFICATION PROGRAMS

LEED building rating system - USGBC
Greening codes, Creating low-carbon cities, Making Buildings resilient - Urban Green Council
Well Building Standard - Delos Building Wellness
Living Building Challenge - International Living Futures Institute (ILFI)
Enterprise Green Communities - NYC Department of Housing Preservation and Development (HPD)
Carbon Disclosure Project (CDP)
Dow Jones Sustainability Index (DJSI)
Global Real Estate Sustainability Benchmark (GRESB)
Carbonn Climate Registry (cCR) / Bonn Center for Local Climate Action and Reporting - Local Governments for Sustainability /ICLEI
Regional Greenhouse Gas Initiative (RGGI)

NYC SUSTAINABILITY INCUBATORS / TEST BEDS URBAN LABS

The Living Lab Demonstration Project - Building Energy Exchange (BEE)
Urban Technology Growth Hub - NYC Economic Development Corporation
Urban Future Lab - Collaboration: NYCEDC, National Grid, NYU Poly
Building Performance Lab - CUNY
NYC ACRE (New York City Accelerator for a Clean and Resilient Economy) - NYU-Poly



COMBINATION

Sustainability districts with existing programs

In analyzing the value of sustainability districts as they tie in to existing programs, we found that there are a number of areas where districts have the unique potential to connect programs with participants.

Districts are not intended to become another well-intentioned stand-alone sustainability initiative. They are meant to provide a platform for implementation. It is important to point out that viewed from this perspective (design of programs vs. implementation), there can be a mutually beneficial relationship between organizations with innovative sustainability programs and the districts that have direct access to a significant number of potential participants.

Additionally, as a node of connection between programs and participants, districts are in a unique position to uncover synergies between existing programs and possibly implement multiple initiatives simultaneously within the district. As an example, a single deep energy retrofit effort for a number of existing buildings aggregated by the district could meet the goals of 80 by 50, the NYC Carbon Challenge, be financed by NYCEEC and the NYC Retrofit Accelerator, supplemented with NYSERDA, ConEdison, and National Grid incentives, participate in the Clinton Climate Initiative, and capitalize on technical analysis provided by the Building Performance Lab and BEEx. The depth of this type of cross-pollination is only achievable when there is a coordinating entity with a foot in both circles. Districts have a unique ability to provide this role.



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Part 3:

Potential preliminary neighborhoods for NYC Sustainability Districts

In this part, two potential sustainability districts, one utilizing the 2030 District goals and the other utilizing EcoDistrict's goals, are described. These potential districts are by no means the only neighborhoods or areas that could become sustainability districts. They are selected here because of their strong potential and applicability to the respective district programs and, along with that, the idea that they would provide good sites for living labs. The results of these labs would provide the knowledge with which a NYC Sustainability Districts program could be better defined and then expanded.

Following the sections on the two potential districts is a section in which possible collaboration between

the two district models is discussed. This collaboration would include, in its most basic form, an exchange of information and experiences.

A stronger collaboration could result in a combined 2030/Eco District. The two district types have many areas of overlap in their goals and their stakeholders as well as the steps in establishing districts. There are also, however, some significant differences in the two models. The section will discuss both.

The last section of Part 2 will present the current status of the two programs in establishing their specific potential districts.



THE CASE FOR sustainability districts in NYC

In the Introduction, the basic reason for sustainability districts in New York City is discussed. There are many programs working in areas of sustainability and resilience, some of which have been described in the "Overview of existing programs" in Part 2. A more complete list can be found in Appendix A.

However, a substantial number of these programs focus on specific topics such as energy conservation, community resilience or affordable housing. While these programs are important and, in many cases, crucial in addressing critical topics, they rarely interact with programs in other (also crucial) areas, resulting in separated silos in which information and goals are often uncoordinated. This can create duplicated, sometimes conflicting, efforts. One result of this is that stakeholders are inundated with – and confused by – a plethora of programs and initiatives. This, in turn, dissuades them from participating in the programs, even when they are financially advantageous and good investments in their properties.

In contrast, both district programs take a more holistic approach, bridging the individual programs' silos in order to create scenarios in which "the whole is greater than the sum of the parts." That whole, when well-coordinated, yields results that are beneficial for many levels of stakeholders: individual properties, the district, the community and the city as a whole. The positive results are not only environmental; they are financial and social as well.

This interdisciplinary approach also enables 2030 and Eco Districts to assist individual programs in fulfilling and, in some cases, exceeding their goals.

The district model will gain credibility with stakeholders by having the sole interest of community sustainability with no other motive or agenda. The capacity to streamline project implementation and manage relationships with both public agencies and private entities will help the district achieve a critical mass of participation to raise the efficiency and performance of its programs.

Sustainability Districts in NYC have the capacity to facilitate collaborative action to:

- achieve community buy-in for programs,
- improve project efficiencies,
- reach critical mass of acceptance for best practices,
- attain economies of scale to meet common goals.



The districts will employ four strategies:

AGGREGATION

One of the strengths of sustainability districts is the ability to bundle similar, often small, properties, resulting in economies of scale for coordinated project management and funding, combined contracting and administration, and bulk purchasing – programs that are often only available to or suitable for large properties. Districts can also streamline the application process for financing, grants, tax incentives and permits.

INTEGRATION

The existing range of public and private programs is currently divided into silos separating the pursuit of key objectives from each other and limiting the development of comprehensive solutions. Sustainability districts provide the unique means to coordinate these silos. An example would be merging the benefits of a district-scale renewable energy network with energy efficiency retrofits and emergency power and heating.

ACTIVATION

Sustainability districts will build a wide network to capture the many stakeholders who have not been reached by public and NGO programs. The districts will facilitate the engagement of individual tenants, households, SMEs and employees by utilizing traditional outreach efforts along with information technology and social media.

Employing permanent “boots on the ground” within the community, sustainability districts will avoid the loss of momentum that can occur after the initial period of intense attention as programs expire or run out of funding and staff.

AMPLIFICATION

The defined area of the district is an appropriate scale to test and develop solutions such as experimental regulatory revisions, advanced energy efficiency, zoning bonuses and tax incentives. By applying bold strategies utilizing a flexible and responsive process, sustainability districts can grasp the higher hanging fruit of cost-effective deep energy and water retrofits, and district energy, water and waste networks to provide scalable, replicable solutions.

POTENTIAL NYC 2030 DISTRICT



Figure 14: Potential Brooklyn 2030 District border

A potential 2030 District could encompass the area of Brooklyn Community District 2, including the Tech Triangle, Downtown Brooklyn, DUMBO and the Brooklyn Navy Yard.¹

This potential district would also contain the residential neighborhoods of Fort Greene, Clinton Hill, Brooklyn Heights, parts of Boerum Hill, the BAM (Brooklyn Academy of Music) Cultural District and Atlantic Yards.

This area includes a broad diversity of land uses including a Central Business District, low- & high-rise buildings, single- and multi-family residential neighborhoods, a civic center, an industrial park, university campuses, cultural institutions as well as parks, waterfront, and transportation and utility facilities. The district includes existing buildings, some dating back to the Civil War, as well as a significant number of new and proposed buildings. Also within the boundaries are prospective sites for sustainable innovation in urban infrastructure and building stock retrofits. This breadth of uses and structures is one of the factors that makes this potential district ideal for the first NYC 2030 District.

Another factor contributing to the selection of this area is the variety of local government and organizational jurisdictions. In addition to the Community Board, there are Business Improvement Districts, Landmark Districts and Industrial Business Zones. An active tech center has startup business, incubators, laboratories and research centers.

A 2012 study² states that the Tech Triangle adds more than \$3 billion into the local economy with an expectation that it will have doubled by 2015. At the time of that study, there were over 9,000 jobs in the triangle area with a prediction of nearly 18,000 by 2015. More than half of the people working in the Tech Triangle live in Brooklyn.

The potential district has many opportunities to address sustainable energy, resilience, community and economic development challenges. The campuses and industrial/business complexes demonstrate capacity for aggregated, community-based networks and district-scale projects. Flooding and property damage that occurred in the low lying areas by the East River during Superstorm Sandy have prompted strong community concerns regarding resilience.

The 2030 District Exploratory Committee has had meetings with several local groups, both governmental and NGO. The committee has received a letter of support from the Brooklyn Borough President, and a member of the committee now sits on the board of the Borough President's Renewable and Sustainable Energy Taskforce (ReSET), which is composed of energy providers, community based organizations, and green energy advocacy groups that share a common goal of improving energy utilization and creating a greener energy infrastructure.

Preliminary meetings have also been held with the Downtown Brooklyn Partnership; the Brooklyn Navy Yard; the Green Manufacturing Center and New Lab, "a

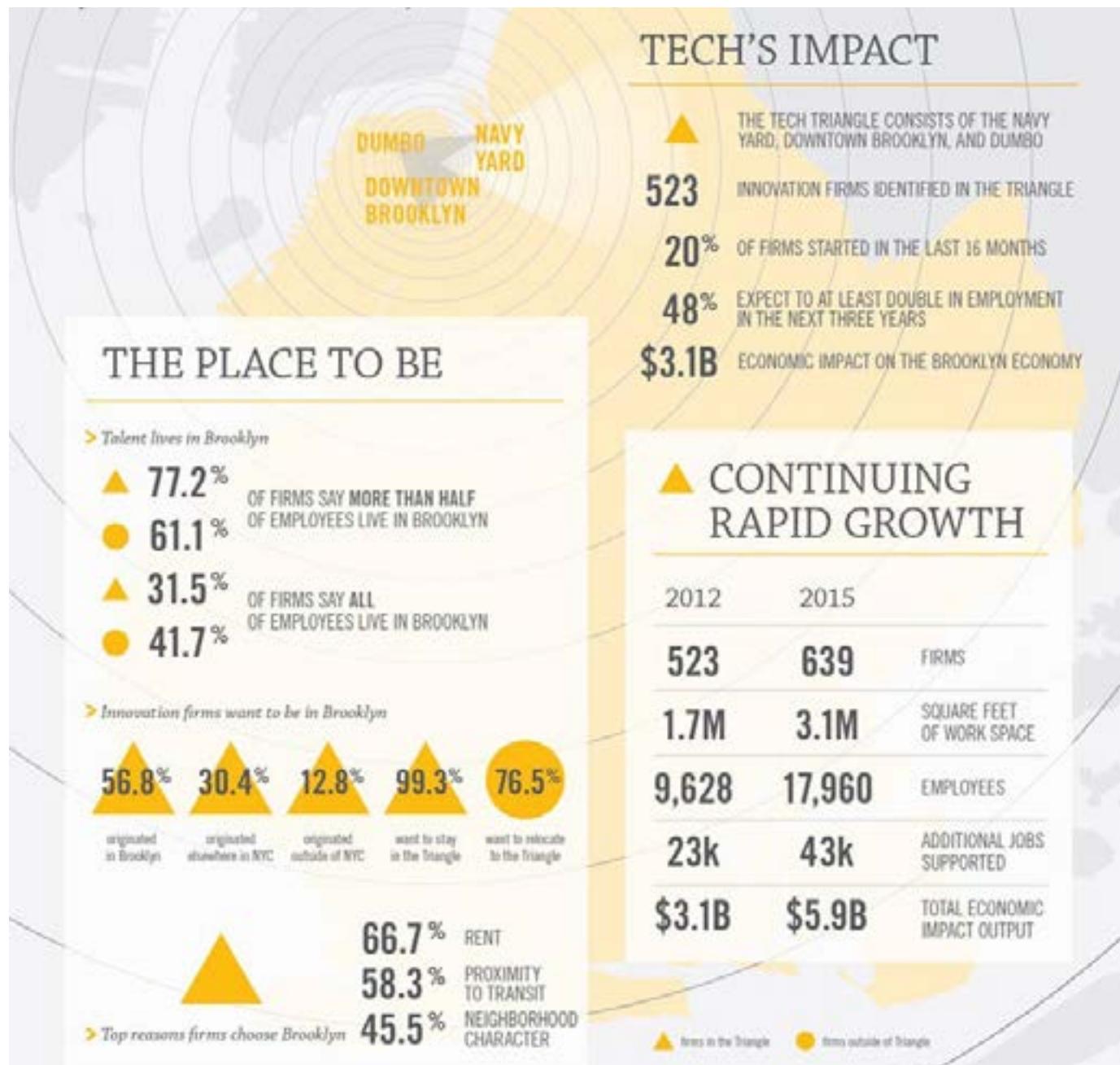


Figure 15. Statistics describing the Brooklyn Tech Triangle

facility in the Brooklyn Navy Yard that fosters innovation in design, prototyping and new manufacturing;³ the Building Energy Exchange, which is a NYC organization providing support for the building industry through energy and lighting efficiency education; and NYCEEC, which "finances energy efficiency, cogeneration, renewables, fuel conversions and demand response projects across all building types and neighborhoods."⁴

As of November 2015, the district has been granted "Emerging District" status by Architecture 2030. As described in Part 1, this is the second of three phases in the creation of a 2030 District.

The 2030 District has been accepted by the Fund for the City of NY's Project Partner Program. The Fund will provide fiscal sponsorship as well as other resource and support services.

The 2030 District Exploratory Committee, in partnership with the CUNY Building Performance Lab, has also carried out an initial study of the current energy performance of the existing building stock of the potential NYC 2030 District, excerpted in Appendix D. The preliminary

boundary of this potential district matches the boundary of the Brooklyn Community District 2. The study estimates the Energy Use Intensity (EUI) of the building stock, establishes current energy targets using 2030 District methodology and then assesses current performance in relation to the 2030 District energy targets. By establishing the current performance, the 2030 District Exploratory Committee can determine how to best provide guidance to help potential members meet targets.

The initial study found that the Energy Use Intensity (EUI) of the current building stock, using 2014 data, is 84.2 kBtu/ft². The district EUI target for the year 2020 (the next target milestone) is 61.4 kBtu/ft², roughly a 27% reduction from current levels. The target is certainly achievable by potential participating district member properties, many of which may already be performing better than the typical building within the district. The study also includes a preliminary summary of assessment of district water consumption in relation to 2030 District water consumption targets.

Area: 2.9 square miles

Population: 99,617 (as of 2010)

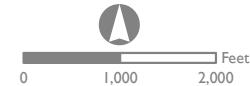
LAND USE, 2014

	Lot Area		
	Lots	Sq. Ft.(000)	%
1- 2 Family Residential	2,345	4,573.0	8.2
Multi-Family Residential	3,225	12,948.4	23.3
Mixed Resid. / Commercial	1,045	4,934.1	8.9
Commercial / Office	454	4,425.8	8.0
Industrial	210	2,252.6	4.1
Transportation / Utility	90	10,021.3	18.0
Institutions	259	8,199.9	14.7
Open Space / Recreation	112	4,865.9	8.7
Parking Facilities	218	1,503.0	2.7
Vacant Land	325	1,750.9	3.1
Miscellaneous	35	203.7	0.4
Total	8,318	55,678.5	100.0

Figure 16: Brooklyn CD2 Land Uses by Area.

Brooklyn Community District 2 - Land Use

NYC PLANNING
DEPARTMENT OF CITY PLANNING CITY OF NEW YORK



Source: MapPLUTO™ V.13.1,
BYTES of the Big Apple
Created July 2013

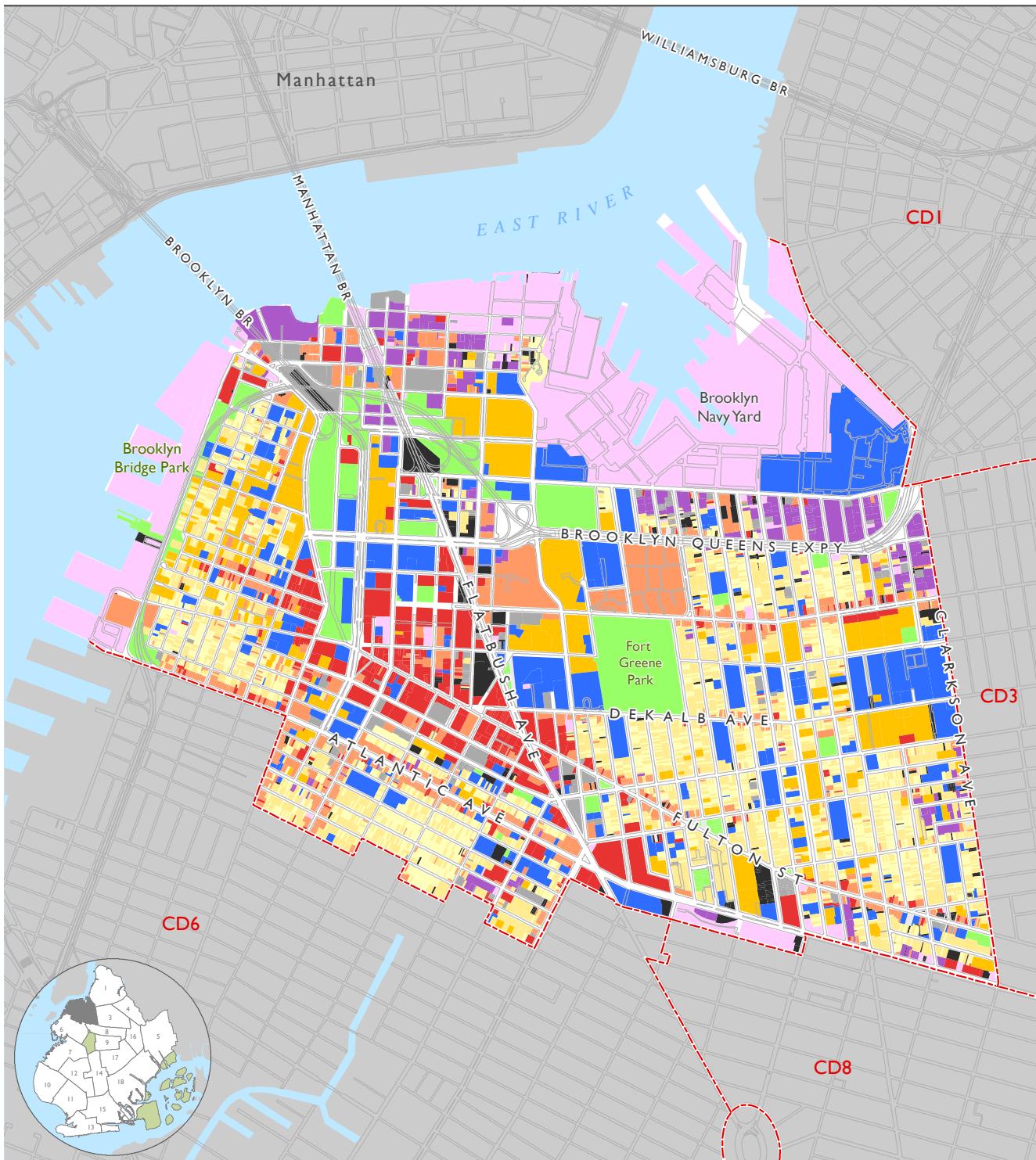


Figure 17: Brooklyn Community District 2 Land Use.

POTENTIAL NYC ECO DISTRICT



Figure 18: Boundary of potential East Harlem Eco District

East Harlem is a potential NYC Eco District. The LOTT Community Development Corporation would be our key district stakeholder and the local leader of the Eco District. Within any potential NYC Eco District, the actual work on the ground will be guided by the EcoDistrict Protocol. A Stakeholder Committee is built around that primary stakeholder. The committee then begins the process of engaging other key members of the community and leads initial workshops to establish goals, physical boundaries, identify early programs, analyze best governance structures for the particular Eco District and engage early funding opportunities.

East Harlem is a vibrant multi-ethnic community that has historically been the home of different assimilating immigration populations over the past 100 plus years. Currently, the predominantly Hispanic and African American population is under severe stress from gentrification and development issues. As in all other parts of Manhattan, long established communities and locally owned businesses are facing threats of displacement and loss of neighborhood identity.

East Harlem has the second highest concentration of both public and privately owned and managed affordable housing stock in New York City. As a result of this fact, there is a tremendous opportunity to work with both the New York City Housing Authority (NYCHA) and not-for-profit community housing organizations. The EcoDistrict framework would be utilized to both preserve and improve the existing affordable housing stock in the community, while working with commercial developers to help preserve the identity and viability of the local business community.

Having the LOTT CDC as our primary stakeholder partner in East Harlem is essential to the success of the emerging East Harlem Eco District.

The LOTT Community Development Corporation was founded in 1988 by Father Robert Lott, who at the time was the pastor of St Francis de Sales Parish on East 96th Street. The current Executive Director of LOTT CDC, Chris Cirillo, is committed to LOTT being the lead stakeholder for the emerging East Harlem Eco District.

"Lott CDC's mission to help house New Yorkers in need has resulted in the development of 27 buildings offering almost 700 affordable rental apartments, from studios to three-bedrooms. Over the past twenty five years, Lott has renovated and redeveloped twenty two vacant and underutilized buildings to provide much-needed housing. This work has rescued entire blocks from the blighting effects of abandonment and decay and has been instrumental in sparking the revitalization of Northern Manhattan. In addition, Lott has built five new buildings, including three exclusively for the seniors. In today's changing neighborhoods of East and Central Harlem, an influx of for-profit development is making the need for affordable housing even more critical. Lott CDC continues to expand the opportunities it can offer New Yorkers in need.

"Lott CDC works closely with its partners at the New York City Department of Housing Preservation and Development, New York City Housing Development Corporation, New York State Homes & Community Renewal, US Department of Housing and Urban Development, and Enterprise Community Partners to finance its affordable apartment communities. True to its mission, Lott CDC continually seeks to provide new services and improve the quality-of-life for its residents." ⁵

East Harlem demographics:

Area: 1.467 square miles

Population: 110,882

Population density: 75,588 people per square mile

Ethnic distribution: 55% Hispanic, 33% Black

Median household income in 2013: \$34,527

Median rent in 2013: \$840

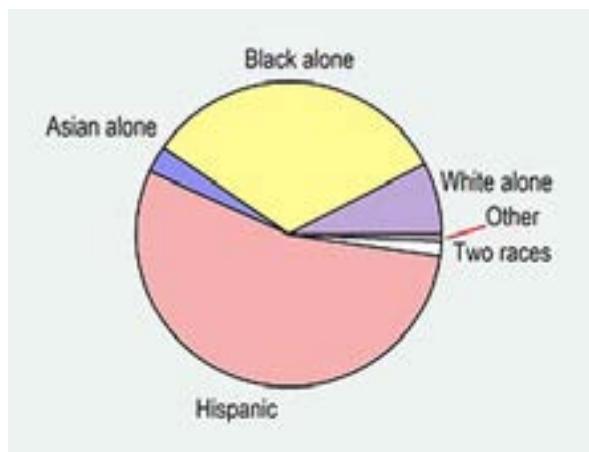


Figure 19: Racial distribution in East Harlem

Other Leading Stakeholders in East Harlem:

The organizations listed below have expressed interest in joining the initial East Harlem Eco District Stakeholder Committee.

The Northern Manhattan Collaborative

This is a collaboration between five northern Manhattan-based Community Development Corporations, of which LOTT is a key member. The other CDCs are: Manhattan Valley CDC, Hope Community Inc, Youth Action, and Harlem CDC. Collectively these CDC's have ownership and management control of over 200 affordable housing properties.

The Mt Sinai Neighborhood Health Initiative

Mt Sinai Hospital, located in the southwest of East Harlem, is a nationally recognized leader in the evolving practice of community-based health initiatives. Situated within the Mt Sinai Research Hospital, the Neighborhood Health Initiative is looking at expanding its presence in the surrounding community through preventive engagement. This initiative views the issues that an East Harlem Eco District will focus on as key engagement opportunities with the surrounding community.

East Harlem Community Alliance

This community-based aggregation alliance has over 100 members, ranging from larger affordable housing advocates to small business organizations.

WE ACT Neighborhood Resiliency Program

West Harlem Environmental Action, Inc (WE ACT for Environmental Justice) is a northern Manhattan community-based organization whose mission is to build healthy communities by involving people of color and/or low-income in the creation of sound and fair environmental health and protection policies and practices. Llewellyn Wells of NYC Eco Districts and Mason Cavell of LOTT CDC have attended the initial round of meetings hosted by WE ACT. This resiliency program aims to create a better prepared and locally staffed group of volunteer alliances designed to provide assistance for ongoing climate change adaptation measures. The East Harlem Eco District is in a position to lead these efforts in East Harlem. WE ACT is also working with organizations in central, west and northern Manhattan to lead the efforts in those communities.

CUNY Hunter College

Hunter College is working with LOTT CDC on a year-long Urban Planning Studio that begins in the fall of 2015. This studio will be looking specifically at how the EcoDistrict Protocol would benefit the East Harlem community.

Timeframe for the Emerging East Harlem Eco District LOTT CDC and the NYC Eco District team hope to officially launch the first phase of the EcoDistrict Protocol process in East Harlem in early 2016. The initial phases of the Protocol typically take up to 2 years to complete.

POTENTIAL FOR A COMBINED DISTRICT: NYC 2030-Eco District opportunities for cross-district collaboration

In the introduction to Part 2, it was stated that there is an opportunity for collaboration between 2030 District and EcoDistricts. A first step in examining this is to look at the similarities and differences in the goals of the two programs and in the processes utilized to achieve those goals. In the Part 1 section "Comparison of the 2030 Districts and EcoDistricts programs," a table presented the comparative properties -- missions, stakeholders, financing methods, goals and metrics, and processes -- of the two programs.

While there are indeed differences in the programs, there are enough similarities that collaboration is possible on one level and perhaps two. A basic collaboration would consist of an ongoing exchange of information, comparing notes and experiences as the districts work on establishing their boundaries through working with stakeholders and meeting their respective goals. Indeed, this is already being discussed by the national organizations:

There is a range of areas where 2030 Districts and EcoDistricts can work together to further create shared value from a collective vision on district development and transformation, including:

- Project and Resource Development
- Training
- Marketing and Communications
- Funding Opportunities

Local 2030 Districts and EcoDistricts are encouraged to partner and work together to

leverage and enhance the work of both initiatives and recognize that their efforts are complementary.⁶

On a higher level, it is possible to envision a combined 2030 and EcoDistrict. The relevant considerations are the degree of compatibility between the two programs and what is gained by creating a district that encompasses the goals of both programs simultaneously. This potential for collaboration will best be developed once each district type has established a working prototype in the city. Currently there are efforts underway to facilitate collaboration between existing EcoDistricts and 2030 Districts in Seattle, Pittsburgh and San Francisco.

The two sustainability district models are distinct and may prove to be complementary in practice. To overly simplify the distinguishing character of each model, 2030 Districts concentrate on commercial building performance and private sector solutions while EcoDistricts focus on building community-based consensus on planning objectives and rely on public sector participation.

It is imperative that the two organizations maintain a coalition in NYC to keep communicating openly, to collaborate on advocacy efforts, and to seek potential avenues for sharing programs or functions. Both district projects will develop an organizational structure and sets of methods and relationships to suit their respective goals. Once established, each sustainability district will exhibit strengths that may be absent in the other, and opportunities to develop reciprocal partnerships may emerge.



The complementary aspects of the districts may evolve into ways to leverage the challenges of each community to achieve possible joint solutions. An example of one potential synergy is the alternating power usage patterns of residential, industrial and commercial zones. This disparity of peaks and valleys of demand may allow a mutually beneficial linking of districts through a microgrid, energy co-op or demand management program. Other synergies may be developed through combining building retrofit projects with educational and job training programs, or coordinating neighborhood

resilience and emergency preparedness initiatives to support common critical facilities.

The process of sharing information and administering collaborative projects between districts can lead to a series of partnerships to guide the formation of a hybrid district or a productive alliance between districts. The best policies and practices discovered through the districts' evaluation processes can be shared between them and replicated throughout the city.



AN OVERVIEW OF PROGRESS

and accomplishments to date of the NYC 2030 District and NYC Eco District

The NYC 2030 District and NYC Eco Districts groups began coordinating efforts in early 2014, encouraged by a small seed funding grant from the Environmental Defense Fund of NYC, to work together to engage funders and city government to adapt district scale programs in the city.

NYC 2030 District:

The 2030 District Exploratory Committee, a volunteer group of professionals, practitioners and advocates in the sustainability field, has held monthly meetings at the AIANY Center for Architecture for over a year. This work has resulted in the NYC 2030 District being granted "Emerging District" status by Architecture 2030.

The Exploratory Committee has had meetings with several local groups, both governmental and NGO. The committee has received a letter of support from the Brooklyn Borough President and is participating in the Borough President's Renewable and Sustainable Energy Taskforce (ReSET).

Preliminary meetings have also been held with the Downtown Brooklyn Partnership, the Brooklyn Navy Yard, New Lab, the Building Energy Exchange (a NYC organization providing energy and lighting efficiency education) and NYCEEC, which "finances energy efficiency, cogeneration, renewables, fuel conversions and demand response projects."⁷

The NYC 2030 District has adopted five goals:

- ACCELERATE SUSTAINABLE ENERGY INNOVATION
- FOSTER SUSTAINABLE COMMUNITY PROSPERITY
- IMPROVE RESILIENCE TO MITIGATE RISKS
- FACILITATE FINANCING OF DISTRICT GOALS
- ADVOCATE FOR POLICY PROGRESS

The 2030 District has been accepted by the Fund for the City of NY's Project Partner Program. The Fund will provide fiscal sponsorship as well as other resource and support services.

NYC Eco Districts:

First launched as the Sustainability Districts Working Group in early 2012, a cross sector group of professionals, concerned citizens, representatives from not-for-profit organizations, practitioners, and staffers from city and state government agencies has been working to further the idea of establishing Sustainability Districts in New York City.

The working group has explored issues around potential Eco District communities and programming, areas of synergy with existing New York City and State programs, possible funding sources and governance structures most appropriate for the NYC area, among other issues pertinent to launching a Sustainability District program.

Over the course of the last three years, organizations as diverse as Enterprise Green Communities, the New York City Housing Authority, the Environmental Defense Fund, the Natural Resources Defense Council, Arup Engineering, Bright Power, Kohn Pedersen Fox, Terrapin Bright Green, Perkins & Will, Lend Lease, Community Solutions, and the NYC Mayor's Office of Sustainability have participated in this process. This research paper and supporting marketing materials are the culmination of that three-year process, with the stated goal launching a Sustainability District in NYC during calendar year 2016.

There are other groups in the NYC area currently exploring launching an EcoDistrict process. In addition to the potential East Harlem Eco District in partnership with the LOTT Community Development Corporation discussed earlier in this paper, there are possible EcoDistricts emerging in the South Bronx, Brownsville, the Rockaways and the Lower East Side.

Part 4: Moving Forward





In this research paper we have attempted to lay out a solid and evidence-based argument for the need to create sustainability districts in New York City. We have discussed various sustainability district programs that are in effect across North America. We have looked specifically and in depth at the 2030 District and the EcoDistricts programs and how and where these programs are being implemented. And we have identified two potential neighborhoods in New York that are prime candidates for initial sustainability districts.

Based on this research, it is our strong conclusion that New York City will benefit greatly from the creation of 2030 and/or EcoDistricts. Our analysis of existing programs addressing issues of sustainability, resiliency, greenhouse gas emissions mitigation, and equitable community development show that sustainability districts can greatly enhance these existing programs. In addition,

and of equal if not more importance, sustainability districts can create efficiencies and other advantages by actively breaking down the siloed nature of most existing programming. All of this will be accomplished while also driving greater community engagement in planning and implementation of all district efforts.

In the spirit of this conclusion, the Steering Committee of the New York City 2030 Districts and the Stakeholder Committee of the NYC Eco Districts Working Group will continue their efforts to establish districts in the city. It is the goal of each of these groups to engage city and state officials, leading stakeholders from potential sustainability districts, other NGOs and civic organizations working on like issues, commercial developers and product and services companies, and both not-for-profit and private enterprise funders in order to launch sustainability districts in 2016.



Sustainability Districts in New York City will:

- Enhance existing programs
- Break down silos for more efficient accomplishment of overall goals
- Facilitate collaboration to access financing, drive innovation and manage projects
- Take advantage of NYC's greatest strength: neighborhoods
- Grow the concept of community-based planning and engagement
- Create more equitable and resilient communities
- Use proven and effective methodologies

We hope you will join us in this effort to establish 2030 and Eco Districts in New York.

For more information about how to get involved and support these endeavors, please contact:

Haym Gross:
nyc2030district@gmail.com
917.576.4957

Llewellyn Wells:
lwell@nycdistricts.com
970.379.7376

Visit us at : www.nycdistricts.com



Appendices

APPENDIX A

NYC-related eco-building and neighborhood programs and initiatives

PROGRAM	AGENCY/ORG	FOCUS	GOALS / SUMMARY
NYS/NYC GOV'T LED INITIATIVES & PROGRAMS			
PlaNYC (Bloomberg) superseded by One New York (de Blasio)	Mayor's Office of Sustainability and Long Term Planning (now Office of Sustainability)	First Comprehensive Sustainability Plan for NYC, 2007	"Strengthen coastal defenses, upgrade buildings, protect infrastructure and critical services, and make our homes, businesses, and neighborhoods safer and more vibrant. A comprehensive plan for sustainable growth for NYC through 2030."

One New York: The Plan for a Strong and Just City (de Blasio)	Mayor's Office of Sustainability	Comprehensive Sustainability Plan for NYC, 2015	<p>Building off of PlaNYC (growth and sustainability, and resilience added after Sandy), with expanded scope to include equity.</p> <p>4 Major Categories - growth (G), equity (E), sustainability (S), resiliency (R).</p> <p>24 Sub-Categories - industry expansion & cultivation (G), workforce development (G), housing (G), thriving neighborhoods (G), culture (G), transportation (G), infrastructure planning (G), broadband (G), early childhood (E), integrated government & social services (E), healthy neighborhoods active living (E), healthcare access (E), criminal justice reform (E), vision zero (E), 80 x 50 (S), zero waste (S), air quality (S), brownfields (S), water management (S), parks & natural resources (S), neighborhoods (R), buildings (R), infrastructure (R), coastal defense (R).</p>
One City Built to Last aka 80 x 50, now a subset of One City Plan	Mayor's Office of Sustainability	Energy in Buildings	<p>Put the city on a path to 80% carbon emissions reduction (from 2005 baseline) by 2050. Lead by example with the city's public buildings achieving a 30% reduction by 2025.</p>

<p>Greener, Greater Buildings Plan (GGBP):</p> <ul style="list-style-type: none"> LL84 - Benchmarking; LL85 - NYC Energy Code (NYCECC); LL87 - Energy Audits & Retro Commissioning; LL88 - Lighting & Sub-metering 	<p>PlaNYC - Green Buildings and Energy Efficiency Enforcement: NYC DOB</p>	<p>Energy in Buildings</p>	<p>Series of Local Laws requiring owners of large buildings (>50,000 gsf) to take a number of actions all related to reducing energy consumption in buildings.</p> <p>LL84 - Benchmarking: measure and report energy and water consumption annually; data available to public. Effective 2011.</p> <p>LL85 NYC Energy Code (NYCECC): established an enforceable energy code for all buildings; updated on regular basis (2/3 years). Effective 2010.</p> <p>LL87 - Energy Audits & Retro-Commissioning: bldgs required to perform energy audit and retro-commissioning once every 10 years. Effective 2013.</p> <p>LL88 - Lighting & Sub-Metering: bldgs required to upgrade lighting to meet current energy code. Sub-meters required to be installed for large tenant spaces. Effective 2025.</p>
<p>Greener, Greater Buildings Plan (GGBP): Financing</p>	<p>PlaNYC - Green Buildings and Energy Efficiency Execution: NYC Energy Efficiency Corporation (NYCEEC)</p>	<p>Financial - Financing</p>	<p>New York City Energy Efficiency Corporation (NYCEEC) launched as part of GGBP to expand financing options for NYC energy efficiency projects. NYCEEC partners with banks, financial institutions involved in community development, and energy services companies to provide financing products for energy efficiency and clean heat improvements. NYCEEC is financially supported by the Energy Efficiency and Conservation Block Grant Program under the American Recovery and Reinvestment Act of 2009, and by private philanthropic foundations including the Deutsche Bank Americas Foundation, Kresge Foundation, Living Cities Foundation, Rockefeller Brothers Fund and Rockefeller Foundation.</p> <p>NYCEEC is an independent, non-profit financial corporation.</p>

Greener, Greater Buildings Plan (GGBP): Tax Incentives	PlaNYC - Green Buildings and Energy Efficiency	Financial - Tax Incentives	Green roof tax abatement: one-year tax abatement of \$4.50 per square foot (up to \$100,000 or the building's tax liability). Available through March 15, 2018. Solar panel tax abatement: a four-year tax abatement of 5% to 8.75% of solar panel-related expenditures (up to \$62,500 or the building's tax liability).
Greener, Greater Buildings Plan (GGBP): Outreach; Training	PlaNYC - Green Buildings and Energy Efficiency	Public Outreach	GGBP Digests issued by Office of Sustainability where training sessions, deadlines, general outreach items are announced. Regular training sessions for LL84 and LL87 most common. Contact: GGBPdigest@cityhall.nyc.gov.
Greener, Greater Buildings Plan (GGBP): Greening the city codes & regulations	PlaNYC - Green Buildings and Energy Efficiency	Building Codes and Zoning	NYC Green Codes Task Force: produced 111 wide-ranging recommendations. To date 29 implemented. Energy Code: establishment of NYC energy code and regular update to energy code. Zone Green: amends zoning regulations to help property owners install a wide range of sustainable elements in new and existing buildings. Heating Oil Regulations: to improve air quality, #6 and #4 oil banned from new boiler installations and #6 now banned for existing boilers.
Greener, Greater Buildings Plan (GGBP): NYC Carbon Challenge (aka Mayor's Carbon Challenge)	PlaNYC - Green Buildings and Energy Efficiency	Energy in Buildings	Carbon reduction challenge: 30% by 2017 from 2005 levels, issued to specific sectors in 2007. Universities, Hospitals, Commercial Office, Multifamily Buildings, and Broadway Theaters. Universities most successful to date.

<p>Greener, Greater Buildings Plan (GGBP): LL86 - LEED Law Municipal GHG Emissions Reduction (30x17)</p>	<p>PlaNYC - Green Buildings and Energy Efficiency Enforcement: Mayor's Office of Environmental Coordination</p>	<p>Public Buildings</p>	<p>LL86 aka LEED Law: any city building (excl. schools) receiving \$10,000,000 in city funding or, if less than \$10,000,000, cases where city funding makes up at least 50, must achieve LEED Silver certification at a minimum. For projects over \$12,000,000, energy cost reductions of 20%, 25%, or 30% are required. Municipal GHG Emissions Reduction aka 30x17: commitment to reduce carbon emissions in city buildings 30% (from 2005 levels) by 2017. Superseded by de Blasio 80x50 plan commitment to reduce carbon emissions from city buildings 30% by 2025.</p>
<p>NYSERDA: New Construction Program; Existing Facilities Program; Multi-Family Performance Program; CHP Programs (sm/lg systems); Demand Management Program; NY Sun (PV); Industrial and Process Efficiency Program</p>	<p>NYSERDA</p>	<p>Financial: Incentives, Financing</p>	<p>Various incentive programs based on project scope and technologies are applied. New Construction Program most common for EE improvements is undergoing massive change, transitioning from incentive (grant \$) to financing.</p>

NYSERDA: Cleaner, Greener Communities	NYSERDA	Financial: Incentives	Grants to encourage communities to create public/private partnerships and scale up sustainable practices that reduce carbon emissions through projects and methods that increase energy efficiency and renewable energy use.
NYSERDA: NY Prize	NYSERDA	Financial: Incentives for Microgrids	A first-in-the-nation \$40 million competition to help communities create microgrids: standalone energy systems that can operate independently in the event of a power outage. Helps communities reduce costs, promote clean energy, and build reliability and resiliency into the electric grid.
NY Green Bank	A Division of NYSERDA	Financial: Financing	State-sponsored, specialized financial entity working with the private sector to increase investments into New York's clean energy markets, creating a more efficient, reliable and sustainable energy system.
Reforming the Energy Vision	NYS Dept of Public Service	Energy Policy	Reform New York State's energy industry and regulatory practices. Promote more efficient use of energy, deeper penetration of renewable energy resources such as wind and solar, wider deployment of "distributed" energy resources, such as micro grids, on-site power supplies, and storage. Promote greater use of advanced energy management products to enhance demand elasticity and efficiencies.

NYC Solar Empowerment zones, Strategic zones	NYSERDA, CUNY, US Dept. of Energy, Con Edison, NYC Dept. of Buildings	PV	"[I]dentify areas where installing solar energy systems will provide the greatest benefits to NYC's electric distribution system. Utility companies across New York State, working with NYSERDA, have also now identified 'Strategic Zones' in their service territories where solar generation would provide the greatest benefits to their electric distribution systems"
NYC Green Schools	School Construction Authority (SCA) with NYC Dept of Education (DOE)	Schools	Increases recycling rates and water efficiency in schools, decreasing greenhouse gas emissions, and ensuring that new school projects are built to sustainable standards. Focused on new construction and major capital improvements. LEED-Schools v2009 based system. Compliance with LL86.
NYC DOE Sustainability Initiative	NYC Dept of Education (DOE)	Schools	The DOE Sustainability Initiative seeks to transform the DOE into a more sustainable and efficient public entity regarding facility operation and maintenance and student environmental education. Focused on operations and education.
High Performance Building Guidelines	Department of Design and Construction (DDC)	Public Buildings	Best practice guidelines for the design of sustainable buildings to ensure that civic buildings are designed and constructed to the highest level of quality, efficiency, and sustainability. Compliance with LL86.
DCAS Energy Management	Department of Citywide Administrative Services (DCAS)	Public Buildings	DCAS Energy Management (DEM) manages the energy accounts and efficiency initiatives for New York City government operations. DEM is responsible for achieving the City's ambitious PlaNYC goal of reducing municipal greenhouse gas (GHG) emissions 30% by 2017.

Energy and Water Retrofit Accelerator	Mayor's Office of Sustainability	Energy / Water in Buildings	Modeled after successful EDF / NYC Clean Heat program; expedite EE retrofits via collaborative framework between city, state, community, and private sector. Key component of mayor's One City Built to Last (80x50).
Next Generation (part of Mayor de Blasio's affordable housing plan)	NYC Housing Authority	Affordable Housing	"[A] long-term strategic plan that details how NYCHA will create safe, clean, and connected communities for our residents and preserve New York City's public housing assets for the next generation" through sustainable development
US DOE - Energy Efficiency and Renewable Energy	US Dept. of Energy	Financial: Incentives	Competitive funding opportunity announcements (FOAs) and solicitations announced through grants.gov website and the EERE Exchange System
Building Performance Lab	CUNY	Energy in Buildings	"[A]dvance high-performance building operations and practices in the existing commercial and public real estate markets."
Sustainable Communities: East New York Bronx / Metro-North	New York and Connecticut Sustainable Communities Consortium through NYC Dept of City Planning and HUD	Regional Transit Oriented Development (TOD)	Bi-state sustainability initiative for coordinated regional and local planning. Purpose: to develop livable communities and growth centers around the region's commuter rail network that will expand economic opportunity by creating and connecting residents to jobs, foster new affordable and energy-efficient housing, provide more transportation choices, strengthen existing communities, and make the region more globally competitive. Started with \$3.5M HUD funding. Sustainable Communities Regional Planning Grant Program. Awarded to 16 projects in region.

PRIVATE SECTOR PROGRAMS			
Sustainable Cities Initiative	Siemens	Private Sector Services	Platform to promote products / services - infrastructure, transportation, water, traffic management, energy efficiency in bldgs, smart grid
Smarter Cities Challenge	IBM	City Planning / Big Data	The Smarter Cities Challenge deploys top IBM experts to help cities around the world address their most critical challenges by putting teams on the ground for three weeks to work closely with city leaders and deliver recommendations on how to make the city smarter and more effective. The Smarter Cities Challenge is IBM's largest philanthropic initiative.
UTILITY PROGRAMS			
Con Edison	Utility: Con Edison	Financial: Incentives	Rebates for high efficiency equipment, controls; demand response and demand management incentives
Cool NYC	Con Edison / Think Eco	Energy in Buildings	AC controller, subsidized by Con Ed
National Grid Energy Efficiency Rebates: Residential Gas	Utility: National Grid	Financial: Incentives	Various rebates / incentives for energy efficiency equipment installed: high efficiency boilers, hot water heaters, thermostats, controls

FOUNDATIONS, NON-PROFIT INITIATIVES & PROGRAMS			
C40 Cities	C40	City Planning	Offers cities an effective forum where they can collaborate, share knowledge and drive meaningful, measurable and sustainable action on climate change. C40 works to empower cities to connect with each other and share technical expertise on best practices.
Sustainable Cities	Bloomberg Philanthropies, partnership with C40	City Planning	Supports city governments' ability to tackle the challenges most relevant to their immediate and long-term needs. Major funder of C40.
Clinton Climate Initiative: Energy Efficiency	Clinton Foundation	Energy in Buildings	Creation of public-private partnerships drives initiatives to fight climate change and spur economic growth. Support for innovative and scalable projects that serve as demonstration projects for the larger market. EE program focuses on EE in buildings. Forestry program and Islands Energy program not applicable.
Connect	Living Cities	Low Income	Works to create livable communities near quality transit corridors that allow residents, especially low-income residents, to affordably connect to job opportunities and essential services through transit-oriented development financing strategies
City Accelerator	Living Cities / Citi Foundation	Low Income	Works in collaboration with local government to implement innovative approaches and improve structural organization to accelerate progress in sustainability and respond better to low income communities' needs.

Sustainable Urban Mobility, Traffic Reduction, Cycling and Walking	Institute for Transportation & Development Policy / Embarq	City Planning	Focus on sustainable urban mobility to integrate smart urban design and transport by encouraging pedestrian and transit-oriented development (PTOD), in which residential and mixed-use buildings are planned around public transport, bike networks and pedestrian facilities, which is critical in order to move away from sprawl and car dependency.
Ross Center for Sustainable Cities	World Resources Institute	City Planning	Partners with other organizations. Works closely with leading financial, business, and city institutions to provide objective information and practical proposals for policy and institutional change to advance the sustainability of cities / greenhouse gas protocol. Implementation of the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions.
100 Resilient Cities Challenge	Rockefeller Foundation	Resilience	100 Resilient Cities is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century. Winners of Challenge will receive: funding in the form of a grant to hire a Chief Resilience Officer; technical support to develop resilience strategy; access to an innovative platform of services to support strategy development and implementation. Platform partners from private, public and nonprofit sectors, and will offer tools in areas such as innovative finance, technology, infrastructure, land use, and community and social resilience; membership in the 100 Resilient Cities network to share knowledge and practices with other member cities.

Database of State Incentives for Renewables & Efficiency (DSIRE)	DSIRE.org	Financial: Incentives	Clearinghouse of energy efficiency and renewable energy incentive opportunities, searchable by geography
SUSTAINABILITY REPORTING / CERTIFICATION PROGRAMS			
LEED building rating system	US Green Building Council	Green Building Certification	Dedicated to sustainable building design and construction, empowering industry leaders to effect the transformation of the local building industry toward sustainability.
Greening codes, Creating low-carbon cities, Making Buildings resilient	Urban Green Council	Code, Policy, Public Outreach	New York Chapter of the U.S. Green Building Council (USGBC). Aims to advance the sustainability of urban buildings through education, advocacy and research.
Well Building Standard	Delos Building Wellness	Green Building Certification	Protocol that focuses on human wellness within the built environment. Prescribes a series of technology enhancements and performance-based measures that are systemized across seven categories relevant to occupant health in the built environment: Air, Water, Nourishment, Light, Fitness, Comfort and Mind.
Living Building Challenge	International Living Futures Institute (ILFI)	Green Building Certification	Beyond LEED for sustainable building design; push toward regenerative architecture; 'holy grail' of bldg rating systems; combines requirements such as net zero energy, net zero water, very stringent material toxicity and embodied energy.

Enterprise Green Communities	Department of Housing Preservation and Development (HPD)	Affordable Housing	Requires new construction and substantial rehabilitation projects receiving HPD funding to achieve Enterprise Green Communities certification
Carbon Disclosure Project (CDP)	CDP	Carbon Reporting	Carbon emissions survey, self-reported by companies, recording of water and forest-risk data. "Through our global system, companies, investors and cities are better able to mitigate risk, capitalize on opportunities and make investment decisions that drive action towards a more sustainable world."
Dow Jones Sustainability Index (DJSI)	DJSI / Robeco SAM	Carbon Reporting	Sustainability survey for largest companies.
Global Real Estate Sustainability Benchmark (GRESB)	GRESB / GBCI (in US)	Carbon Reporting	Sustainability survey specifically targeted to real estate: energy, water, and waste data. Also looks at sustainability policies within company.
Carbon Climate Registry (CCR)	ICLEI Local Governments for Sustainability, Bonn Center for Local Climate Action and Reporting	Carbon Reporting	Online platform for cities worldwide to self-report greenhouse gas emission reduction and climate adaptation targets, achievements and actions.
Regional Greenhouse Gas Initiative (RGGI)	RGGI	Carbon Trading	Market-based regulatory program in the United States to reduce greenhouse gas emissions. RGGI is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce CO2 emissions from the power sector.

NYC SUSTAINABILITY INCUBATORS / TEST BEDS			
The Living Lab Demonstration Project	Building Energy Exchange (BEEEx)	Sustainable Technology Incubator	Collaboration between Lawrence Berkeley National Laboratory and Green Light New York that explores and advances innovative integrated lighting, daylighting, and shading systems in working office environments. The team will document the metrics, economics, and lessons learned, and develop resources to aid the widespread deployment and successful operation of these energy saving systems. Two leading financial institutions are hosting "living lab" demonstration floors within their flagship NYC headquarters.
Urban Technology Growth Hub	NYC Economic Development Corporation	Sustainable Technology Incubator	The Hub will provide dedicated workspace, access to prototyping and testing resources, and a strong community with shared objectives and services to support entrepreneurs and early stage companies with innovative ideas aiming to address urban challenges in the clean technology, energy, infrastructure, and smart cities sectors
Urban Future Lab	NYCEDC, National Grid, NYU Poly	Sustainable Technology Incubator	"New York City's clean technology entrepreneur center, clean and tech incubator dedicated to envisioning and realizing innovation in the cleantech sector, with a particular focus on energy, sustainable urban infrastructure, water, transportation, waste, air quality. Create high-impact ventures, combining access to next-generation technology, guidance, expertise, and resources."

New York City Accelerator for a Clean and Renewable Economy (NYC ACRE)	NYU Tandon School of Engineering, with funding from the NYSERDA	Sustainable Technology Incubator	Incubator in Lower Manhattan involving 14 tenants in cleanweb, transportation, real estate, energy efficiency, lighting, finance, policy research, utilities, smart grid, and energy storage, dedicated to growing an ecosystem of entrepreneurs, international companies, and innovative local businesses that provides solutions to climate and energy issues in NYC.
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APPENDIX B

Existing sustainability programs and their compatibility with districts programs

PROGRAM	AGENCY/ORG	2030 DISTRICT	ECO DISTRICT
NYS/NYC GOV LED INITIATIVES & PROGRAMS			
PlaNYC (Bloomberg) superseded by One New York (de Blasio)	Mayor's Office of Sustainability and Long Term Planning (now Office of Sustainability)	X	X
One New York: The Plan for a Strong and Just City (de Blasio)	Mayor's Office of Sustainability	X	X
One City Built to Last aka 80 x 50 now a subset of One City Plan	Mayor's Office of Sustainability	X	X
Greener, Greater Buildings Plan (GGBP): LL84 - Benchmarking LL85 - NYC Energy Code (NYCECC) LL87 - Energy Audits & Retro Commissioning LL88 - Lighting & Sub-Metering	PlaNYC Green Buildings and Energy Efficiency Enforcement: NYC DOB	X	X
Greener, Greater Buildings Plan (GGBP): Financing	PlaNYC Green Buildings and Energy Efficiency Execution: NYC Energy Efficiency Corporation (NYCEEC)	X	X
Greener, Greater Buildings Plan (GGBP): Tax Incentives	PlaNYC Green Buildings and Energy Efficiency	X	X
Greener, Greater Buildings Plan (GGBP): Outreach Training	PlaNYC Green Buildings and Energy Efficiency	X	X

Greener, Greater Buildings Plan (GGBP): Greening the city codes and regulations	PlaNYC Green Buildings and Energy Efficiency	X	X
Greener, Greater Buildings Plan (GGBP): NYC Carbon Challenge (aka Mayor's Carbon Challenge)	PlaNYC Green Buildings and Energy Efficiency	X	X
Greener, Greater Buildings Plan (GGBP): LL86 - LEED Law Municipal GHG Emissions Reduction (30x17)	PlaNYC Green Buildings and Energy Efficiency Enforcement: Mayor's Office of Environmental Coordination	X	X
NYSERDA: New Construction Program Existing Facilities Program Multi-Family Performance Program CHP Programs (sm / lg systems) Demand Management Program NY Sun (PV) Industrial and Process Efficiency Program	NYSERDA	X	X
NYSERDA: Cleaner, Greener Communities	NYSERDA	X	X
NYSERDA: NY Prize	NYSERDA	X	X
NY Green Bank	A division of NYSERDA	X	X
Reforming the Energy Vision	NYS Dept of Public Service		
NYC Solar Empowerment Zones, Strategic Zones	NYSERDA, CUNY, US Dept. of Energy, Con Edison, NYC Dept. of Buildings (DOB)	X	X
NYC Green Schools	School Construction Authority (SCA) with NYC Dept of Education (DOE)	X	X
NYC DOE Sustainability Initiative	NYC Dept of Education (DOE)	X	X

High Performance Building Guidelines	Department of Design and Construction (DDC)		
DCAS Energy Management	Department of Citywide Administrative Services (DCAS)	X	X
Energy and Water Retrofit Accelerator	Mayor's Office of Sustainability	X	X
Next Generation (part of Mayor de Blasio's affordable housing plan)	NYC Housing Authority	X	X
US DOE Office of Energy Efficiency and Renewable Energy (EERE)	US Dept. of Energy	X	X
Building Performance Lab	CUNY	X	X
Sustainable Communities: East New York Bronx / Metro-North	New York and Connecticut Sustainable Communities Consortium through NYC Dept of City Planning and HUD	X	X
PRIVATE SECTOR PROGRAMS			
Sustainable Cities Initiative	Siemens		
Smarter Cities Challenge	IBM	X	X
UTILITY PROGRAMS			
Con Edison	Utility: Con Edison	X	X
Cool NYC	Con Edison / Think Eco		
National Grid: Energy Efficiency Rebates - Residential Gas	Utility: National Grid	X	X
FOUNDATIONS, NON-PROFIT INITIATIVES & PROGRAMS			
C40 Cities	C40	X	X
Sustainable Cities	Bloomberg Philanthropies, partnership with C40	X	X

Clinton Climate Initiative: Energy Efficiency	Clinton Foundation	X	
Connect	Living Cities		
City Accelerator	Living Cities / Citi Foundation	X	X
Sustainable Urban Mobility, Traffic Reduction, Cycling and Walking	Institute for Transportation & Development Policy / Embarq		
Ross Center for Sustainable Cities	World Resources Institute	X	X
100 Resilient Cities Challenge	Rockefeller Foundation		
Database of State Incentives for Renewables & Efficiency (DSIRE)	DSIRE.org	X	X
SUSTAINABILITY REPORTING / CERTIFICATION PROGRAMS			
LEED building rating system	US Green Building Council	X	X
Greening Codes, Creating Low-carbon Cities, Making Buildings Resilient	Urban Green Council		
Well Building Standard	Delos Building Wellness		X
Living Building Challenge	International Living Futures Institute (ILFI)	X	X
Enterprise Green Communities	Department of Housing Preservation and Development (HPD)		
Carbon Disclosure Project (CDP)	CDP		
Dow Jones Sustainability Index (DJSI)	DJSI / Robeco SAM		
Global Real Estate Sustainability Benchmark (GRESB)	GRESB / GBCI (in US)	X	
Carbon Climate Registry (CCR)	ICLEI Local Governments for Sustainability, Bonn Center for Local Climate Action and Reporting		
Regional Greenhouse Gas Initiative (RGGI)	RGGI		

NYC SUSTAINABILITY INCUBATORS / TEST BEDS			
The Living Lab Demonstration Project	Building Energy Exchange (BEEEx)	X	X
Urban Technology Growth Hub	NYC Economic Development Corporation		
Urban Future Lab	NYCEDC, National Grid, NYU Tandon	X	
New York City Accelerator for a Clean and Resilient Economy (NYC ACRE)	NYU Tandon, with funding from NYSERDA	X	X

APPENDIX C:

Descriptions of other selected sustainability programs

Better Buildings Challenge and Better Buildings Initiative

Created by the Energy Efficiency and Renewable Energy (EERE) section of the US Department of Energy, Better Buildings is not a districts project. It is, as the name suggests, an energy efficiency program directed toward voluntary leaders among CEOs and other executives. Its purpose is to encourage energy efficiency among nearly all building types, with the exception of single-family homes.

"The Better Buildings Challenge supports commercial and industrial building owners by providing technical assistance and proven solutions to energy efficiency. The program also provides a forum for matching Partners and Allies to enhance collaboration and problem solving in energy efficiency. Both Partners and Allies are publically recognized for their leadership and innovation in energy efficiency."¹

The requirements are to develop, initiate and complete at least one building under a ten-year plan to reduce energy consumption by at least 20%. Partners are also required to develop and share information, including metrics and implementation.

The Better Buildings Challenge is a part of the larger Better Buildings Initiative² which, in turn, also includes the Better Buildings, Better Plants Challenge³ and the Better Buildings Neighborhood Program.⁴ The Better Plants Challenge is for industrial buildings, while the

Better Buildings Neighborhood is closer to a district-style program, helping "state and local governments develop sustainable programs to upgrade the energy efficiency of homes and buildings." New York State is a partner in the program. The participating community closest to NYC, among more than 40 nationally, is Bedford in Westchester County.

Cleaner, Greener Communities

Cleaner Greener Communities (CGC) is a grant funding program administered by the New York State Energy Research and Development Authority (NYSERDA). "The primary goal of the program is to encourage communities to create public-private partnerships and develop regional sustainable growth strategies in such areas as emissions control, energy efficiency, renewable energy, low-carbon transportation, and other carbon reductions."⁵

CGC is a regional program involving two phases of competitive grants to promote and advance the "many benefits of sustainability": lower costs, more jobs, and better quality of life. Phase 1, which is finished, gave \$10m to regional planning groups to either create or expand comprehensive sustainability plans. Phase 2 provides \$90m to regional projects that help attain goals identified in Phase 1.⁶

Sustainability Plans have been created, to date, in ten regions.³ The NYC Region grant in Phase 1 was used to expand the scope of PlaNYC to include a supplemental document: "New York City's Pathways to Deep Carbon Reduction."⁸ The goals include:

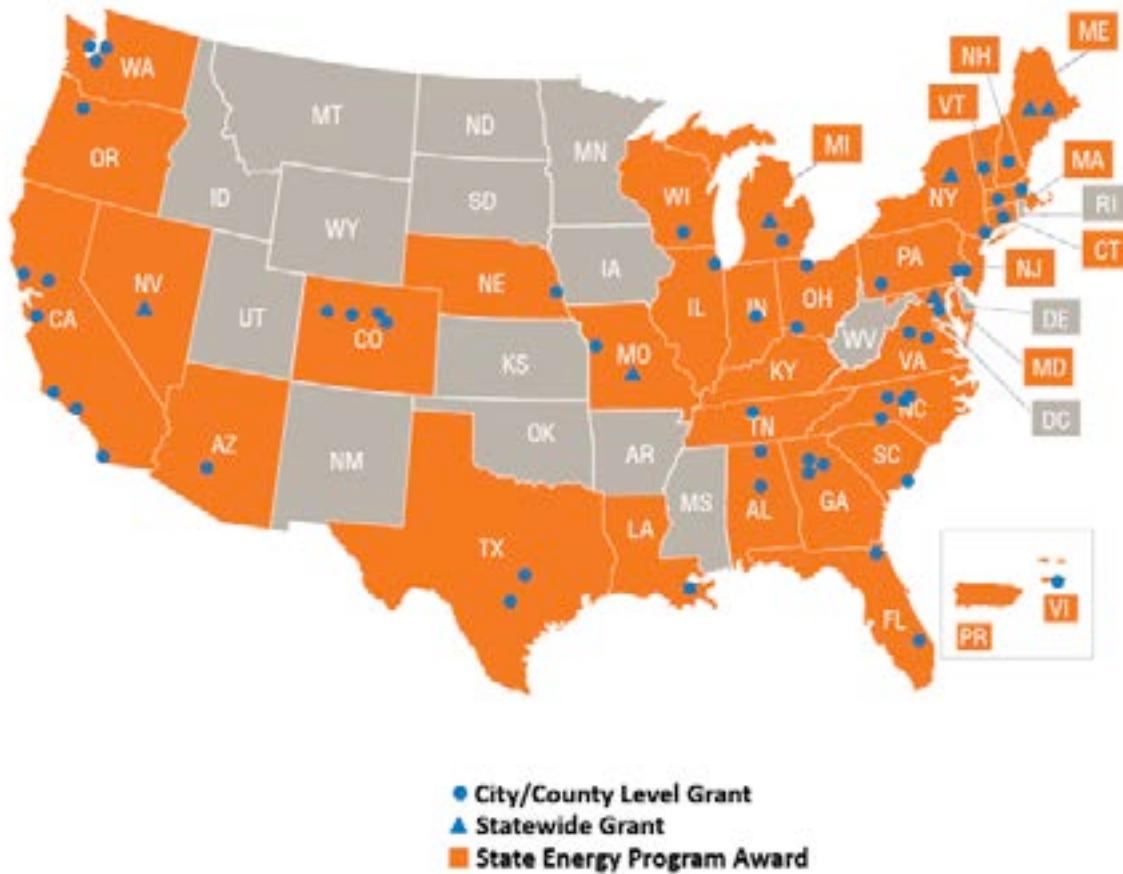


Figure 20: Partners in the Better Buildings Neighborhood program

Develop a roadmap to reduce city-wide greenhouse gas emissions 80 percent by 2050.

Quantify the economic benefits of meeting the City's current goal of a 30 percent reduction in greenhouse gas emissions by 2030.

Provide further research into the City's current greenhouse gas inventory to better understand and report on neighborhood-level emissions and energy use.⁹

Emerald Cities

Emerald Cities Collaborative (ECC) is described as "a national nonprofit network of organizations working together to advance a sustainable environment while creating greater economic opportunities for all. We're transforming the energy efficiency sector in a high road way, by retrofitting building stock, creating high wage jobs, and revitalizing the local economies of our metropolitan regions."¹⁰

ECC's "local and national partners bring resources and expertise from the community, labor, business, and government sectors."

There are currently nine urban chapters of ECC: Cleveland, Los Angeles, Milwaukee, Oakland, Portland, Providence, San Francisco, Seattle and New York.¹¹ Emerald Cities New York (ECNY) is organized by the Bronx Cooperative Development Initiative (BCDI): "a collaborative of local community and labor organizations, anchor institutions and community-supportive business and finance entities."¹²

ECNY's approach works with community organizations and local partners toward several goals:

Planning, financing and implementing "community-owned microgrids¹³ in order to lower local energy consumption and costs, enhance energy security and climate resilience and created shared wealth through community ownership."

Organizing "community leaders to leverage local assets and create shared wealth for Bronx residents," ensuring "that New York State's new energy regulations support community priorities and that the City of New York's energy efficiency initiatives create job opportunities for communities of color and low-income New Yorkers."¹⁴ As of 2013, ECNY is working with two BCDI projects: BlocPower and the Northwest Bronx Community and Clergy Coalition.

"The first project will complete deep energy efficiency retrofits for faith-based institutions in the northwest Bronx; the second will focus on multifamily housing in the Central Bronx. These retrofits will reduce property owners' energy consumption and costs, while creating high-road, green job opportunities for Bronx residents."¹⁵

Cleveland EcoVillage

The Cleveland EcoVillage project, launched in 1998,¹⁶ can be seen as a precursor to the EcoDistricts program. A collaboration between the Detroit Shoreway Community Development Organization (DSCDO) and EcoCity Cleveland, the EcoVillage, despite being site-specific, describes itself as "a national model for revitalizing a built neighborhood centered around a light rail station."¹⁷ It is intended to "pilot methods for reducing emissions and responding to climate change on a very local level through community engagement."¹⁸

This community engagement emphasis, at the time, was unusual. The prevailing planning approach had been a "top down" one in which designs and policies originated from government agencies, and often were delivered as *faits accompli*, remnants of the Robert Moses era and 1960s urban renewal. The EcoVillage approach was more "bottom up," if not quite grass roots. Residents of the neighborhood were interviewed as part of the research that resulted in "integrating eco-friendly features into the community without overshadowing it."¹⁹

Those eco-friendly features went beyond conventional energy efficiency and green building to incorporate such issues as storm water management, local food and community gardens, composting, and alternative transportation. In fact, the district's boundaries were defined by the distance from a mass transit station, making it an early version of what has become known as transportation-oriented development (TOD). Even less conventional, the program incorporated non-environmental goals ranging from crime reduction to public art.

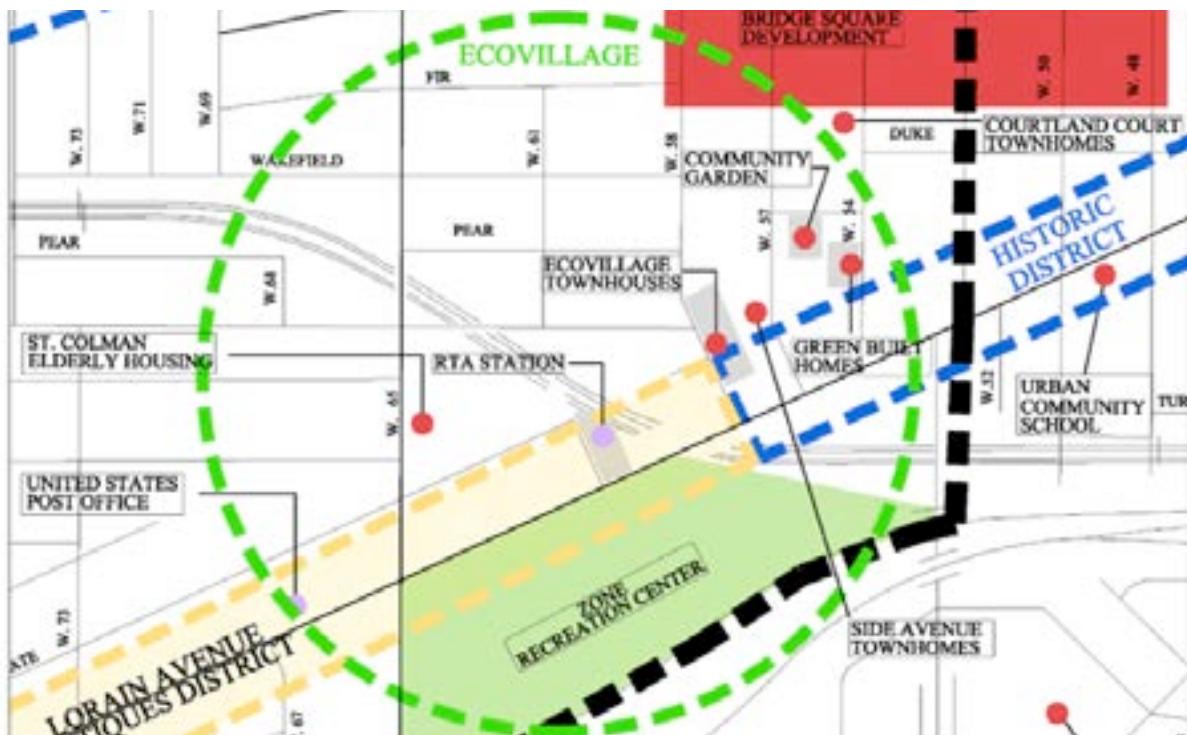


Figure 21: The Cleveland EcoVillage boundary is based on a 15 minute / $\frac{1}{4}$ mile walking distance from the RTA station

The success of Cleveland's EcoVillage has encouraged the adoption of EcoDistricts elsewhere in Cleveland, notably the Kinsman EcoDistrict, as well as an emphasis on sustainability throughout the city.

Green Impact Zone of Missouri

Like the Cleveland EcoVillage, the Green Impact Zone of Missouri is a site-specific sustainable district that is also seen as a national model. The initiative to create the zone from a 150 square-block economically depressed

core area of Kansas City began in 2009 with a proposal from the local U.S. Representative in anticipation of federal stimulus funds. It is described as "an effort to concentrate resources – with funding, coordination, and public and private partnerships – in one specific area to demonstrate that a targeted effort can literally transform a community."²⁰

The goal was to "put people and dollars to work to strengthen neighborhoods, create jobs and improve energy efficiency. The initiative included housing rehab

and weatherization programs, community policing and services, job training and placement, and health and wellness programs, all built around a comprehensive neighborhood outreach program and using sustainability as a catalyst for transformation.”²¹

Though the initiative originated in a top-down manner, neighborhood leaders were heavily consulted, as were

residents. The outreach included 99,443 telephone contacts, 45,766 door-to-door contacts, and 3,629 participants in zone-wide events. In that process, eight priorities were identified (as shown in Figure 23): housing, weatherization, employment and training, infrastructure, energy efficiency, urban agriculture, public safety and community services, and youth.²² In the third year of the program “staff and neighborhood

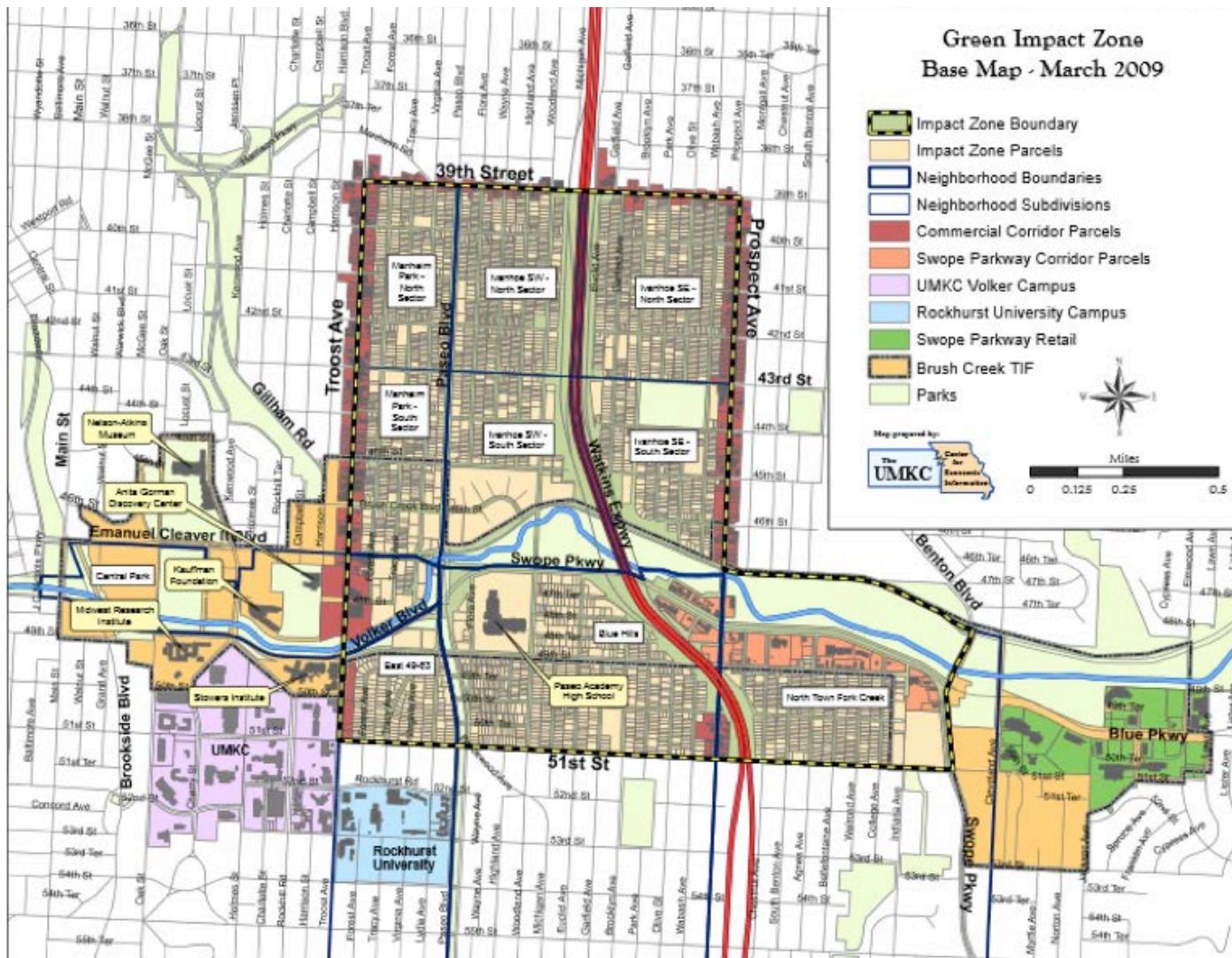


Figure 22: Map of the Kansas City Green Impact Zone

leaders revisited each of these areas, and reorganized the priorities into three key strategy areas: housing, public safety and community services, and employment and training.”

According to the Green Impact Zone website, there were significant achievements on all of the eight priorities including affordable housing, community leadership training, job placements, a small business incubator, new sidewalks, home weatherization, energy retrofits and smart meters, some with in-home displays.

Though the project is titled a Green Impact Zone, it seems a majority of the strategies were related to other community concerns such as housing, public safety and employment. This may have been a reflection of the community survey which asked “what are the most important problems facing residents of the Green Impact Zone?” Crime, noise and litter were some of the top responses while environmental topics such as air pollution, asthma and noise were much further down in the community priorities.²³



Figure 23: Diagram of the Kansas City Green Impact Zone priorities.

Enterprise Green Communities

While affordable housing was one of the priorities of the Kansas City Green Impact Zone, it is the focus of Enterprise Green Communities. Within that focus, though, is the imperative that the housing incorporate public health and environmental as well as economic benefits.²⁴

Also contrasting with the Kansas City program, which was site specific and developed with significant community input, Enterprise Green Communities is a nationwide program that is oriented more toward the creation of affordable housing and seeks to achieve that result by “help[ing] developers, investors, builders and policymakers make the transition to a green future for affordable housing.”²⁵ That makes it a more top-down process that, perhaps because it is not site-specific, utilizes less community involvement. This probably also reflects the fact that the Enterprise program is largely directed to new housing, where there is no existing community base, as opposed to improvements in existing communities.

Enterprise Green Communities utilizes a set of eight criteria which, when fulfilled, results in certification. According to Enterprise, “Certified Enterprise Green Communities properties cost less to operate and maintain, use fewer natural resources, generate less waste and contain fewer toxic materials, contributing to a healthier environment.”²⁶

The breakdown of these criteria (see Figure 24) can be found in the 2015 Enterprise Green Communities Criteria manual.²⁷

The two-step certification process is similar to some green building certifications in that it incorporates pre-build and post-build submittals. The first step occurs as the design process ends and before construction begins, and the second step takes place after completion and the Certificate of Occupancy is received. As with the LEED (Leadership in Energy and Environmental Design) process (see below), significant emphasis is placed on "integrated design," a process in which "the entire project team – including [designers,] consultants, owners and contractors -- meets to propose and discuss fundamental ideas" before design has begun.²⁸

FortZED

FortZED (ZED is an abbreviation of zero energy district) is a demonstration program in a district of Fort Collins, CO. Similarly to some of the other district programs, the primary focus of this program is on energy.

"FortZED is a testing ground to prototype innovative ideas that move us toward a more efficient and sustainable future.

"FortZED is all about energy. FortZED connects the public, private and academic sectors so they can



Figure 24: The eight categories of the Enterprise Green Communities criteria.



Figure 25: Green Communities mission

work together to experiment with new technology that saves money and energy and helps create jobs locally. When successful, FortZED can be copied in other communities around the globe.”²⁹

The “testing ground” aspect is further explained on the “What We Do” page of the FortZED website:

“FortZED tries cutting-edge technology developed by university researchers, City utility experts and businesses. Under this umbrella, trial-and error experiments are welcome and help push ideas into real-world applications! As an example, FortZED provided the structure for university researchers to test use of distributed power – power located close to the company/electric consumer – on the City’s electrical grid.

“This collaborative, ‘whole systems approach’ is designed to move Fort Collins toward a more efficient and sustainable future. This is accomplished by:

- Increasing renewable energy production
- Improving energy efficiency
- Managing peak energy usage
- Reducing greenhouse gas emissions”³⁰

The two-square mile district program is led by a collaboration of three organizations: Fort Collins Utilities, UniverCity Connections, and the Colorado Clean Energy Cluster. The district contains a significant amount, 10 -15% and 7200 customers, of the Fort Collins Utility’s electric distribution system.³¹ It was funded in part by the U.S. Department of Energy’s Renewable and Distributed Systems Integration initiative along with matching and other funds. According to a document by the Fort Collins city government

“FortZED will be realized through a systems approach with a broad portfolio of smart grid technologies, renewable energy sources and supporting public policies. Energy generation will come from renewable sources within a 50-mile radius of FortZED; renewable and conventional distributed sources within the district; and demand reduction and response within the district.”³²

A major goal was to address peak load. In a demonstration test of the program, spanning more than four weeks, five companies were able to reduce their peak load demand by more than 20%, in line with the program’s overall goals.³³



Figure 26. The FortZED district in downtown Fort Collins and incorporating the campus of Colorado State University
New Urbanism

The Congress for New Urbanism (CNU), which was founded in 1993 and now has chapters in 16 states and 2 Canadian provinces,³⁴ claims to be “the leading organization promoting walkable, mixed-use neighborhood development, sustainable communities and healthier living conditions.”³⁵ One of the significant ways in which New Urbanism differs from the sustainability districts that are the focus of this paper is that New Urbanism pertains to villages while sustainability districts, as we consider them here, address urban areas.

Though CNU villages are not designed specifically with

energy-efficiency in mind, their layouts, with walkability a primary goal, result in lessened energy demand for transportation.

The charter of The New Urbanism lists 27 principles.³⁶ A simplified version of this, found on the New Urbanism website (distinct from the CNU website), has ten principles: walkability, connectivity, mixed-use and diversity, mixed housing, quality architecture and urban design, traditional neighborhood structure, increased density, green transportation, sustainability, and quality of life.³⁷

Strongly related to New Urbanism is the concept of smart growth. The principles of smart growth³⁸ as well as the focus on suburban development are quite similar to those of New Urbanism and they are often used interchangeably. The primary difference is that New Urbanism looks more to traditional, pre-suburban sprawl villages as a model.

The most well-known example of New Urbanism is the Florida town of Seaside. “Unfortunately, it is an imperfect example in that it is a high-end resort community (as opposed to an economically diverse primary home and work community.) [A] frequent complaint is that [New Urbanism communities] tend to look and feel like scenes from The Truman Show (which, in fact, was filmed at Seaside).”³⁸

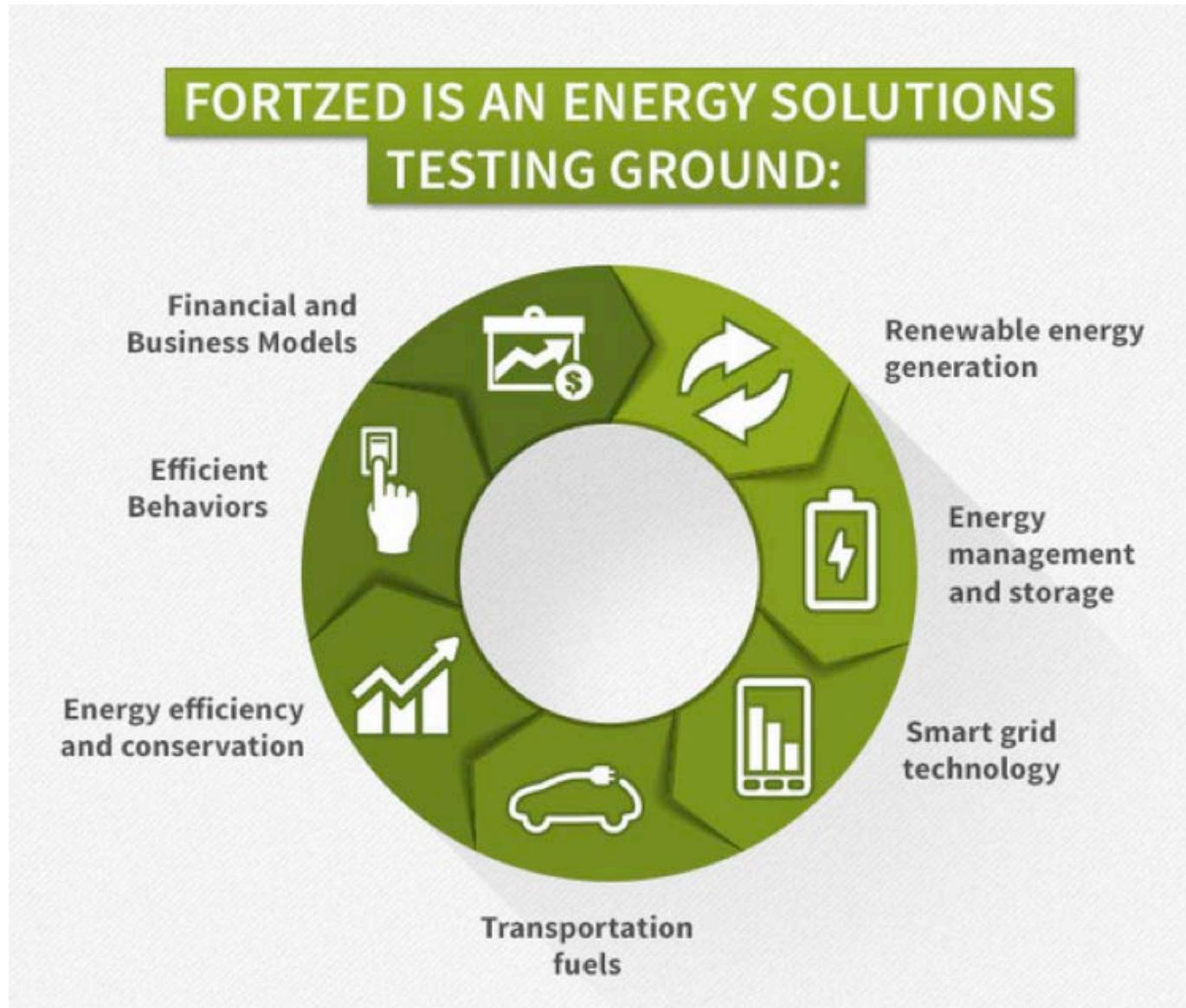


Figure 27. Diagram of FortZED's areas of emphasis
STAR Communities

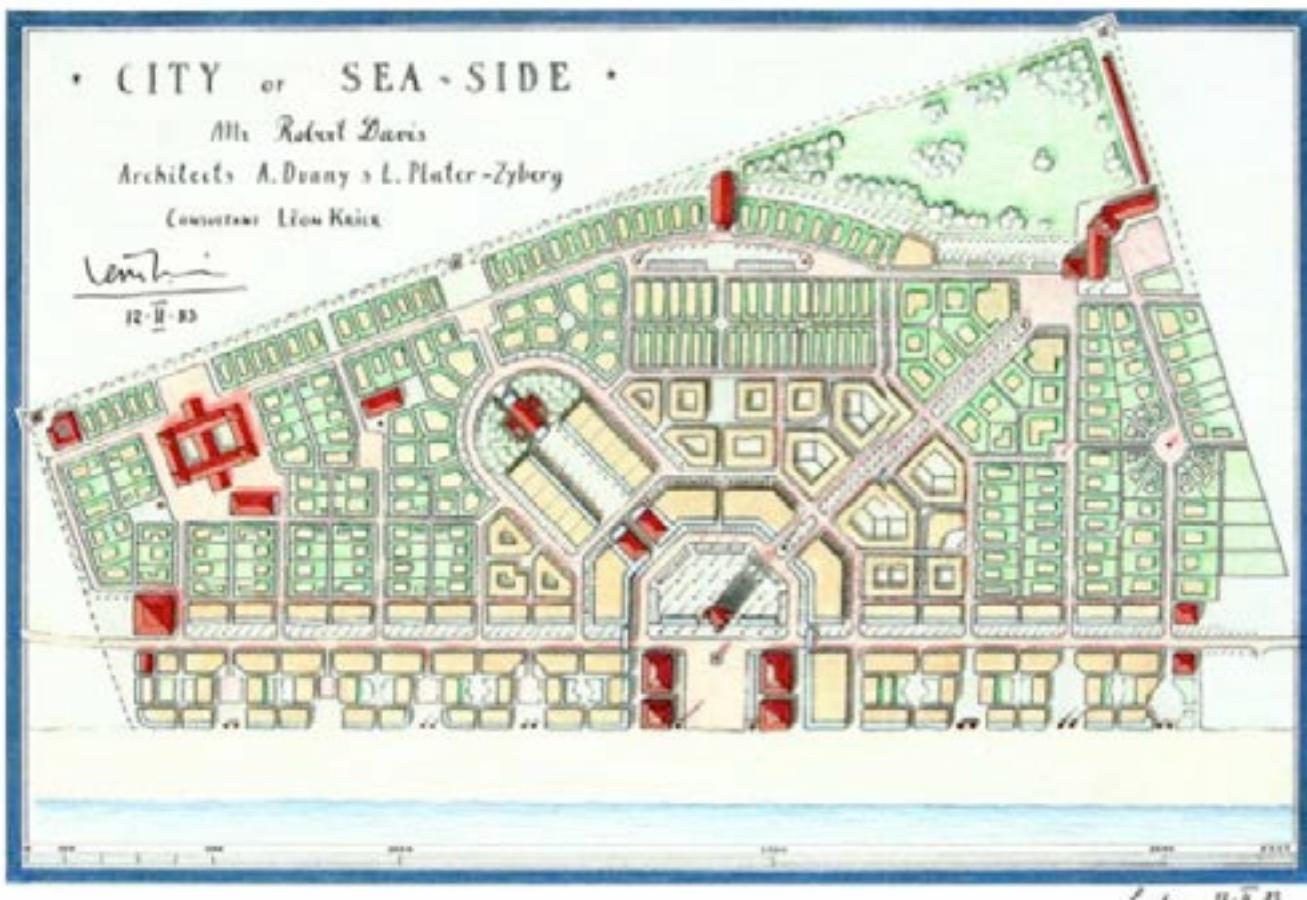


Figure 28: Layout of Seaside, Florida. (Even the drawing attempts to evoke a more traditional style.)

STAR (Sustainability Tool for Assessing and Rating communities) Communities describes itself as "a nonprofit organization that works to evaluate, improve and certify sustainable communities."⁴⁰ Released in 2012, STAR claims to be "the first national certification program to recognize sustainable communities."⁴¹ It was developed by a consortium of ICLEI - Local Governments for Sustainability USA, the U.S. Green Building Council, the National League of Cities and the Center for American Progress.

STAR Communities has a lengthy definition of what comprises a sustainable community,⁴² but what is perhaps more significant is their rating system. That system is based on seven goals, each with 5-7 objectives, which are evaluated according to two types of measures: Community Level Outcomes and Local Actions.

"Community Level Outcomes are measurable, condition-level indicators that show community

progress on a STAR Community Rating System Objective. Examples include reductions in energy use or increased transportation access.

"Local Actions are the things you do to move toward the Community Level Outcomes - the

range of decisions, investments, programs, plans, and codes that a local community puts in place.

"Actions focus on interventions that move the needle toward desired Outcomes, and can be



Certified STAR Communities (As of February 1, 2015)

5-STAR

Northampton, MA
Seattle, WA

4-STAR

Austin, TX
Broward County, FL
Davenport, IA
Evanston, IL
Portland, OR
Tacoma, WA
Tucson, AZ
Washington, DC

3-STAR

Albany, NY
Atlanta, GA
Chandler, AZ
Cleveland, OH
Des Moines, IA

El Cerrito, CA
Fayetteville, AR
Fort Collins, CO
Indianapolis, IN
Lee County, FL

Figure 29. Certified and pending STAR communities.

Built Environment	Climate & Energy	Economy & Jobs	Education, Arts & Community	Equity & Empowerment	Health & Safety	Natural Systems
Ambient Noise & Light	Climate Adaptation	Business Retention & Development	Arts & Culture	Civic Engagement	Active Living	Green Infrastructure
Community Water Systems	Greenhouse Gas Mitigation	Green Market Development	Community Cohesion	Civil & Human Rights	Community Health & Health System	Invasive Species
Compact & Complete Communities	Greening the Energy Supply	Local Economy	Educational Opportunity & Attainment	Environmental Justice	Emergency Prevention & Response	Natural Resource Protection
Housing Affordability	Industrial Sector Resource Efficiency	Quality Jobs & Living Wages	Historic Preservation	Equitable Services & Access	Food Access & Nutrition	Outdoor Air Quality
Infill & Redevelopment	Resource Efficient Buildings	Targeted Industry Development	Social & Cultural Diversity	Human Services	Indoor Air Quality	Water in the Environment
Public Spaces	Resource Efficient Public Infrastructure	Workforce Readiness		Poverty Prevention & Alleviation	Natural & Human Hazards	Working Lands
Transportation Choices	Waste Minimization				Safe Communities	

Figure 30: STAR sustainability goals (across the top) and their objectives.

done by both the local government and other community groups and partners.”⁴³

Unlike some of the other programs discussed in this paper, STAR is designed for use by local governments rather than other public or private entities. “STAR was built by and for local governments who were seeking a common framework for sustainability; a standard set of metrics by which to compare progress; and the challenge and competition that a recognition program offers.”⁴⁴

“While partnerships are encouraged, the governmental entity is the approved primary applicant...”⁴⁵ Non-governmental groups can become STAR Affiliates as opposed to STAR Member Communities. Applicants utilize the STAR Community Rating System which is point based. Depending on how many objectives

the application fulfills and the points that result, the community may become a 3, 4, or 5-STAR Community. The first 5-STAR community rating was awarded to North Hampton, MA in May 2014.⁴⁶

LEED-ND

LEED-ND (Leadership in Energy and Environmental Design – Neighborhood Development) is an outgrowth of the USGBC’s LEED program.⁴⁷

Where STAR Communities was developed with an eye toward improving existing communities, LEED-ND is designed for communities that are in a planning phase, in progress, or completed. While most of the LEED designations apply to buildings, LEED-ND “looks beyond

Goal Area	Points Available
Built Environment	100
Climate & Energy	100
Economy & Jobs	100
Education, Arts & Community	70
Equity & Empowerment	100
Health & Safety	100
Natural Systems	100
Innovation and Process	50
Total	720

Figure 31: STAR rating system points weighting. The points are further broken down into specific objectives

the scale of buildings to consider entire communities.

Why? Because sprawl is a scary thing.”⁴⁸

As with STAR, LEED-ND is a points-based “checklist” rating system. In Version 4, two things were updated. LEED-ND was divided into two types, one for neighborhoods in the planning phase and another for those that are built. It was also brought into alignment with the other LEED designations in having a possible total of 110 points. The number of points achieved determines whether the neighborhood is awarded a Certified, Silver, Gold or

Platinum rating.

The LEED-ND system is arranged in five categories: Smart Location & Linkage, Neighborhood Pattern & Design, Green Infrastructure & Buildings, Innovation & Design Process, and Regional Priority Credits. Each of these is broken down into subtopics that are either required or can achieve up to a specific number of points.

The report in this appendix is an abridged version

Yes	?	No	
0	0	0	Smart Location & Linkage
Y			Prereq Smart Location Required
Y			Prereq Imperiled Species and Ecological Communities Required
Y			Prereq Wetland and Water Body Conservation Required
Y			Prereq Agricultural Land Conservation Required
Y			Prereq Floodplain Avoidance Required
			Credit Preferred Locations 10
			Credit Brownfield Remediation 2
			Credit Access to Quality Transit 7
			Credit Bicycle Facilities 2
			Credit Housing and Jobs Proximity 3
			Credit Steep Slope Protection 1
			Credit Site Design for Habitat or Wetland and Water Body Conservation 1
			Credit Restoration of Habitat or Wetlands and Water Bodies 1
			Credit Long-Term Conservation Management of Habitat or Wetlands and Water Bodies 1

Figure 32: Section of the checklist for LEED-ND for Built Projects.

APPENDIX D

Energy performance of buildings in a potential NYC 2030 District

of a white paper prepared by Ben Rosenblum, Xiao Lin, and Bryan Ramo in a partnership between the NYC 2030 District Committee and the CUNY Building Performance Lab. The report characterizes the current energy performance of the emerging NYC 2030 District in relation to 2030 District energy targets.

The preliminary boundary of the emerging NYC 2030 District, which covers a large portion of downtown Brooklyn and matches the boundary of the Brooklyn Community District 2, is used for data purposes. The report establishes an estimated baseline for EUI and a preliminary water use intensity (WUI) following the 2030 district baseline methodology. In order to determine the district-wide baseline EUI, this report draws on public NYC data available through Primary Land Use Tax Lot Output (PLUTO) and the NYC Local Law 84 (LL84) benchmarking report. The baseline EUI determined from PLUTO for the NYC 2030 District is 76.8 kBtu/sq.ft. The 2014 estimated NYC 2030 District EUI is 84.2 kBtu/sq.ft. The 2014 estimated NYC 2030 District EUI is 84.2 kBtu/sq.ft.

In the year 2020, the district-wide EUI target is 61.4 kBtu/sq.ft., a 20% reduction from the baseline, and in the year 2030, the EUI target is 38.4 kBtu/sq.ft., a 50% reduction from the baseline. The district-wide baseline, current EUI, and targets are developed to provide an overview of the energy performance of buildings in the District. The baseline and targets will become more accurate though as more detailed energy data is gathered. Data for a sample office building is included in this report to demonstrate how more detailed individual building data refines individual building baselines.

District Performance Goals

The proposed NYC 2030 District adopts the Architecture 2030 incremental target reductions as the performance metric for new buildings, major renovations and existing construction. The performance metrics aim to reduce energy and water consumption and also reduce transportation emissions. The main focus of this report is to develop energy baselines, use those baselines to establish targets, and assess current district-wide performance in relation to those targets. A preliminary water baseline is also established. Transportation baseline and performance will be assessed as more data become available.

New Buildings and Major Renovation Performance Targets

Energy: Implement a 70% reduction below the regional/median average in 2015, with a 10% incremental target reduction, and becoming carbon neutral (a building that uses no fossil-fuel or GHG-emitting energy to operate) by 2030.

Water: Implement a 50% reduction below the current regional/median average for the district.

CO₂ from auto and freight: Implement a 50% reduction below the current regional/median average for the district.

Existing Building Performance Targets

Energy: Implement a 10% reduction in 2015 with incremental target reductions every five years of 20%, 35% and 50% reduction by 2030.

Water: A 10% reduction in 2015 with incremental target reductions every five years of 20%, 35% and 50% reduction by 2030.

CO2 from auto and freight: A 10% reduction in 2015 with incremental target reductions every five years of 20%, 35% and 50% reduction by 2030.

The boundary of the potential NYC 2030 district matches the boundary of Brooklyn Community District 2, one of eighteen community districts throughout the Brooklyn borough. The 2030 District includes the neighborhoods of Boerum Hill, Brooklyn Heights, Clinton Hill, Downtown Brooklyn, DUMBO, Fort Greene, Fulton Ferry, the Navy Yard and Vinegar Hill. According to the PLUTO database, there is a total of approximately 7,500 properties within the 2030 district. The total building area of the NYC 2030 District is 122.5 million sq. ft.

District Characterization

The building classifications in the PLUTO dataset were transformed into an equivalent 2030 District space type.

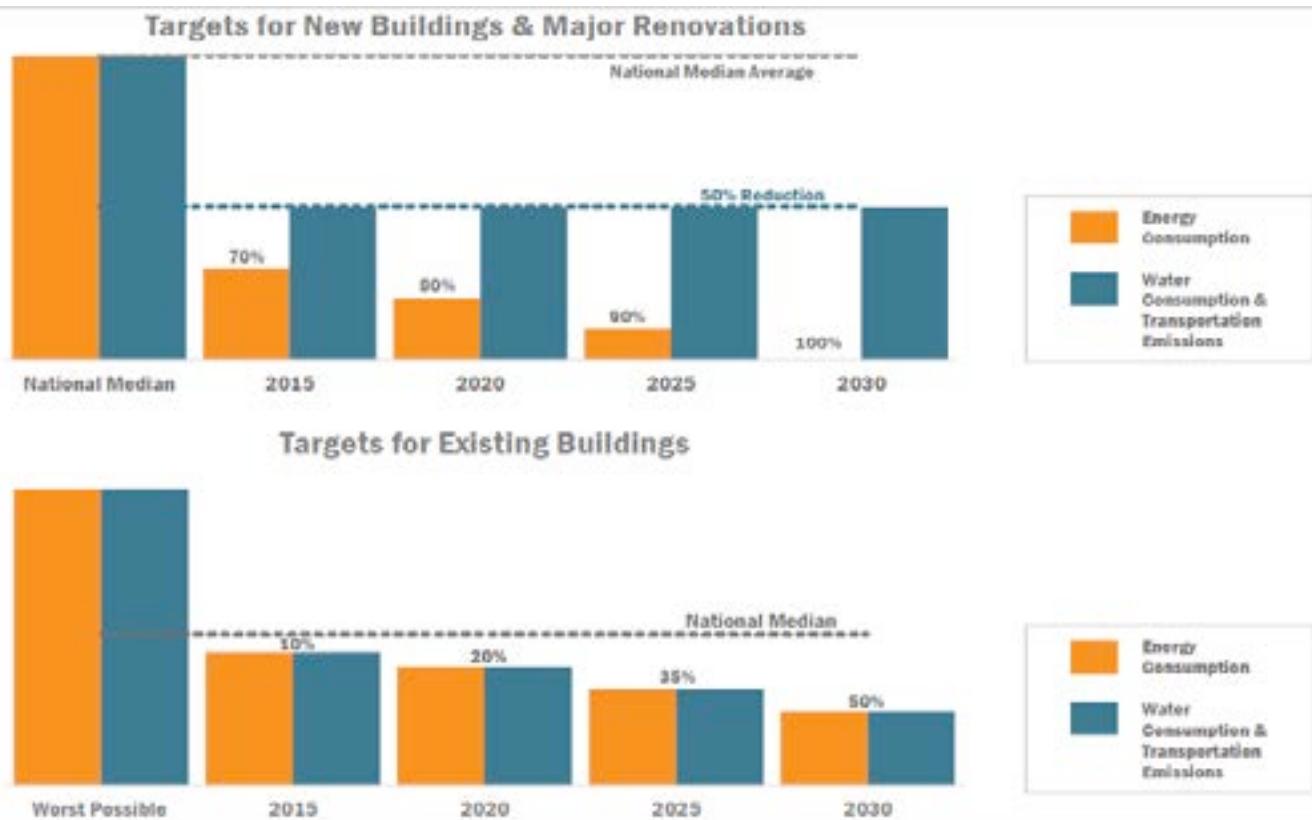


Figure 33: 2030 District Targets

Figure 34 shows common space types that exist within the NYC 2030 District. Note that the category "Other" contains space types that make up less than 2% of the total square footage of the district. This includes spaces such as single-family homes, worship facilities and parking. The space types that have the largest area in the NYC 2030 District are multifamily housing at approximately 48.9% and office buildings at approximately 16.8% of the total building area.

District Energy Baselines

In accordance with the 2030 Challenge, the energy performance baseline for each building is determined individually by using the national average/median energy consumption of existing U.S. commercial buildings gathered by the 2003 Commercial Building Energy Consumption Survey (CBECS)². The data compiled for CBECS represent a

national survey that includes costs, consumption and

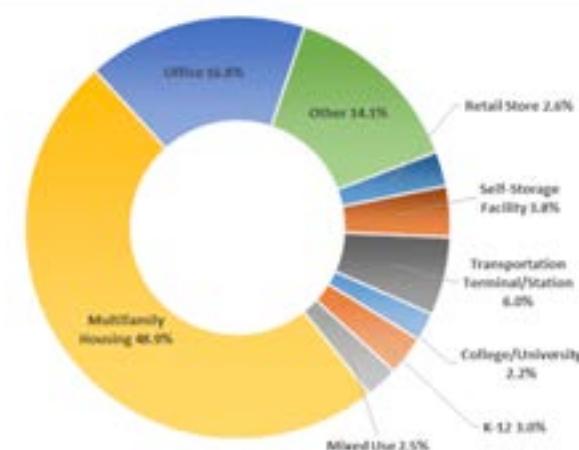


Figure 34: NYC 2030 District Space Types

energy building-specific characteristics. The metric used for building energy consumption is the site EUI which is the annual energy use divided by the gross square footage, measured in kBtu/sq.ft.-yr. Generally a lower EUI indicates better building performance.

Baselines for New Construction & Renovated Buildings

New construction and renovated building³ baselines can be estimated using the online tool, Target Finder⁴, which also determines the national average/median energy consumption of specific building types in a specific region based on CBECS data. This should be the first tool used by designers for new buildings. Design teams should skip "Section 4, Estimated Design Energy" to ensure that the baseline is an average fuel mix. Also the "Target % Better than Median" should be set for 70% reduction to follow the 2030 Challenge goals for 2015.

Baselines for Existing Buildings

Each existing building has an individual baseline calculated by using specific parameters that include location, space use profile, and operating hours. The easiest way to determine individual building baselines is using the Environment Protection Agency's (EPA) online tool, Portfolio Manager,⁵ which provides the national average/median energy consumption for a specific building in a specific region using CBECS data.

Baseline for Unique Building Types

Most buildings will fall under the space types listed in Portfolio Manager and Target Finder. However, there will be some building types in these tools that do not have a national median/average energy consumption. In those cases, the EPA's Portfolio Manager Technical Reference, U.S. Energy Use Intensity by Property Type,⁶ should be used. The reference guide is also based on the 2003 CBECS data and contains national median EUIs.

District-Wide Existing Building Energy Baseline

In order to get a sense of the overall current performance of buildings within the NYC 2030 District, an estimated district-wide baseline was established by aggregating property-specific energy baselines. Each building type in the district either has a static baseline EUI or a baseline EUI equation determined using Portfolio Manager. Of the approximate 7,500 reported buildings within the NYC 2030 District listed in PLUTO, not all buildings were uploaded to determine the baseline. It was determined that roughly 6,800 properties had a single primary use while the remaining properties were considered to have a secondary property use. In order to determine the district-wide baseline, approximately 500 properties with single primary and secondary use were considered. Approximately 15-20 buildings were chosen for each space type, across a wide range of square footage, and uploaded to Portfolio Manager. Default energy characteristics including operational hours, number of computers, and other factors, also had to be used in order to calculate each building-specific baseline. Table 1 below presents the baseline EUI estimates for different space types.

Energy Baseline Estimates for Single Building Use in Brooklyn 2030 District		
Building Use	Static	Variable
Bank Branch	-	$Y = 0.00000001SF^2 - 0.0012SF + 119.3$
College University	165	-
Convenience Store	286	-
Courthouse	-	$Y = 8.0531 * \ln(SF) + 29.626$
Enclosed Mall	95.2	-
Entertainment/Public Assembly: Movie Theater, Museum, Performing Arts, and Other	56.4	-
Fire/Police Station	82.4	-
Hospital (General Medical & Surgical) (<50,000 SF)	208	-
Hospital (General Medical & Surgical) (>50,000 SF)	-	$Y = (8E-22)SF^4 - (2E-15)SF^3 + (2E-09)SF^2 - 0.0008SF + 338.41$
Hotel	97.5	-
K-12	-	$Y = -11.07 * \ln(SF) + 213.85$
Library	156	-
Manufacturing/Industrial Plant	N/A	-
Mailing Center/Post Office	60.6	-
Mixed Use Property	65.6	-
Multifamily Housing < 17000 SF	68.2	-
Multifamily housing >17000 SF	63.2	-
Office (<5,000 SF)	66.8	-
Office (5,000 < SF <200,000)	-	$Y = 13.584 * \ln(SF) - 50.162$
Office (>200,000 SF)	115.6	-
Other - Education	75.4	-
Other - Lodging/Residential	94.6	-

Other - Public Services	65.6	-
Other - Recreation	64.2	-
Other - Service	60.6	-
Other - Specialty Hospital	208	-
Other - Utility	65.7	-
Parking	10	-
Prison/Incarceration	90.6	-
Restaurant	230.4	-
Retail (< 5,000 SF)	54.6	-
Retail (>5,000 SF)	-	$Y = 8.6084 * \ln(SF) + 6.6786$
Self-Storage Facility	23	-
Senior Care Community	146.5	-
Single Family	N/A	-
Transportation Terminal Station	56.4	-
Urgent Care/Clinic/Other outpatient	82.4	-
Vocational School	75.4	-
Worship Facility	45.3	-
Y = Energy Baseline Estimate; ln = Natural Logarithm; SF = Building Square Footage		

Table 1: EUI baselines for the NYC 2030 District

Each building-specific baseline was then determined by multiplying the estimated baseline energy use intensity by the building's area. The district-wide baseline EUI was then calculated by summing up the total baseline energy consumption of all buildings in the data set (9,169,198,012 kBtu) and dividing by the total square footage of aggregated properties (119,461,161 sq.ft.) which results in an aggregated district-wide estimated baseline of 76.8 kBtu/sq.ft. It should be noted manufacturing/industrial and single-family spaces were omitted in the calculations since there was no building-specific baseline.

District-Wide Estimate of Current EUI

In order to determine an estimate of current EUI for the NYC 2030 District, the 2014 LL84 Benchmarking Report⁷ was used. The report, using publicly available data, contains building-specific annual energy and water consumption data. Only buildings greater than 50,000 sq.ft. were required to report. This dataset was cleaned up for inconsistencies, outlined in the steps below. Several data cleaning methods were adopted from the City of New York LL84 Data Analysis & Quality Assessment by Dr. Hsu.⁸

Cleaning Steps	Remaining buildings	Number of Buildings Removed
Original	16,170	-
Only consider filed DOF Benchmarking Status	12,085	4,085
Remove no reported EUI	10,478	1,243
Remove Buildings with no Property Floor Area	11,721	364
Exclude Source EUI less than 5 kBtu/ft ² -yr or greater 1,000 kBtu/ft ² -yr	10,340	138
Duplicate Entries	10,219	121

Table 2: Cleaning Method for 2014 LL84

EUIs less than 5 kBtu/sq.ft. or greater than 1,000 kBtu/sq.ft. were omitted since either extreme was unrealistic based on current engineering knowledge and would greatly affect the aggregate site average EUI. The removal of duplicate entries was based on perfect duplicate entries and duplicate BBL (Borough, Block, Lot). Note that this may have eliminated some properties that have duplicate entries and have reasonable numbers, but it was not possible to determine in this report. The current EUI values were determined using the same method applied to the PLUTO database in which the total energy consumption was summed and divided by the total square footage of aggregated properties.

NYC 2030 District Performance

The current EUI for the NYC 2030 district includes 211 reported properties in the 2014 LL84 Benchmarking Report. The total site energy consumption reported (2,899,730,550 kBtu) divided by the total square footage of aggregated properties (34,420,738 sq.ft.) results in a average site EUI of 84.2 kBtu/sq.ft. The current performance for reported buildings greater than 50,000 sq.ft. is 9.6% above the baseline. The current EUI of the District is similar to the EUI of the two largest use type areas which, are multifamily housing at 59.0% and office buildings at 18.2%. The EUIs for those space types are 85.0 and 76.4 kBtu/sq.ft., respectively. If reported

properties could achieve a 10% reduction from the baseline for District 2015 reduction goal, the NYC 2030 District could avoid 519,753,144 kBtu in energy demand, which is equivalent to the energy consumption for 5,197 households (assuming 100,000 kBtu/household⁹).

Figure 36 illustrates that some multifamily properties have made progress toward the 50% energy reduction goals, but there is still a large portion of properties that are above the baseline. The average Site EUI for multifamily properties is 85.0 kBtu/sq.ft., 34% higher than the baseline (63.2 kBtu/ft² for multifamily > 17,000 sq.ft.). Four multifamily properties have met the 2030 reduction target (-50%). Nine properties have met the

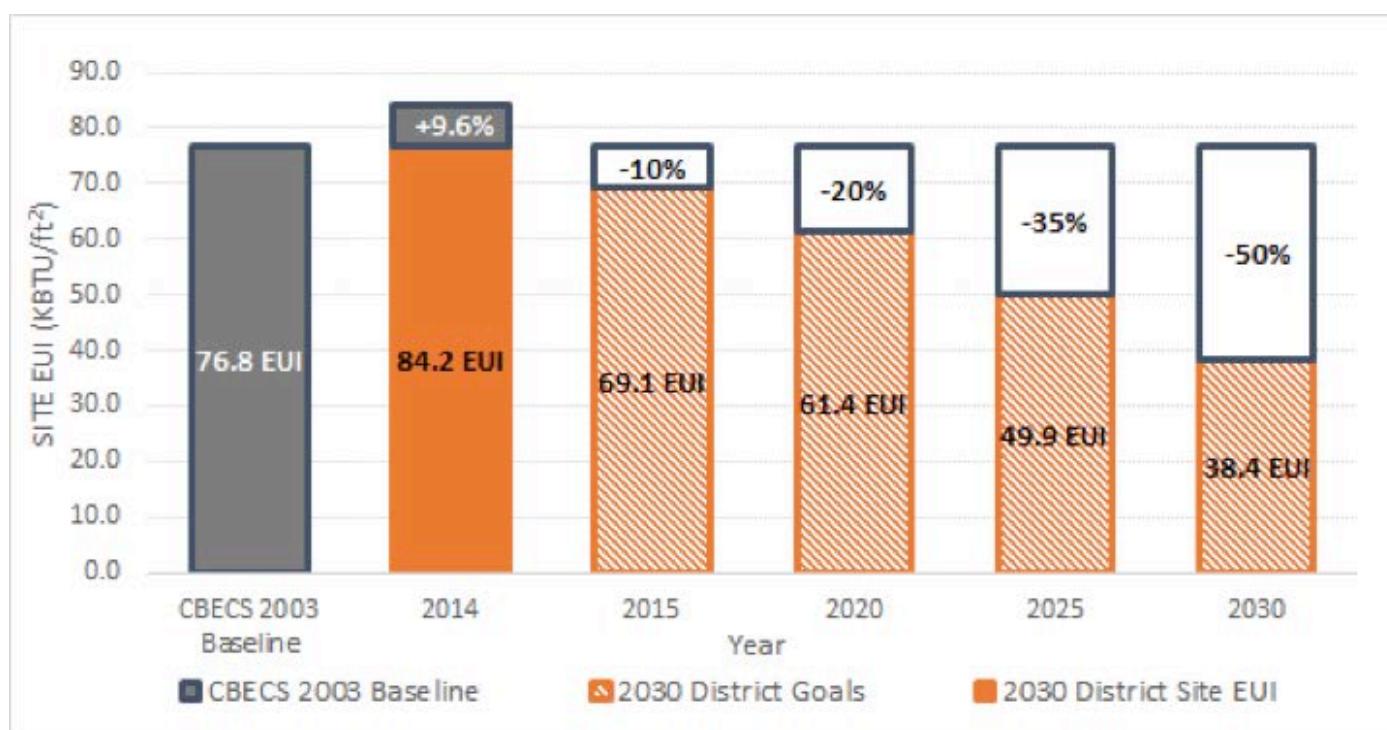


Figure 35: NYC 2030 District Performance based on 2014 LL84 Data

2020 reduction target (-20%) and six properties have met the 2015 reduction target (-10%) or are performing better than the baseline. Over 85% of multifamily properties reported are performing worse than (above) the national median average.

There are 25 reported office buildings within the 2030 District boundary reported in LL84. 13 office buildings have a building area greater than 200,000 sq.ft. Figure 37 illustrates their progress toward 2030 District goals and, taken collectively, are performing below the baseline. The aggregate EUI of the 13 office buildings is 78.1 kBtu/sq.ft., 32% lower than the baseline (115.6 kBtu/sq.ft. for Office > 200,000 sq.ft.). 85% of the properties have an EUI

below the baseline and 46% have already achieved the 2030 goal (-50%). 15% of Office buildings reported are performing worse than (above) the national median average.

Building K (highlighted in dark orange) in Figure 37 represents a sample office building in which energy consumption data were provided by CUNY Building Performance Lab (BPL). Once 12 months of energy consumption data becomes available, a more accurate estimate of a building's baseline can be developed.

In Figure 38, a more accurate baseline of 82 kBtu/sq.ft. has been developed for Building K, the sample office

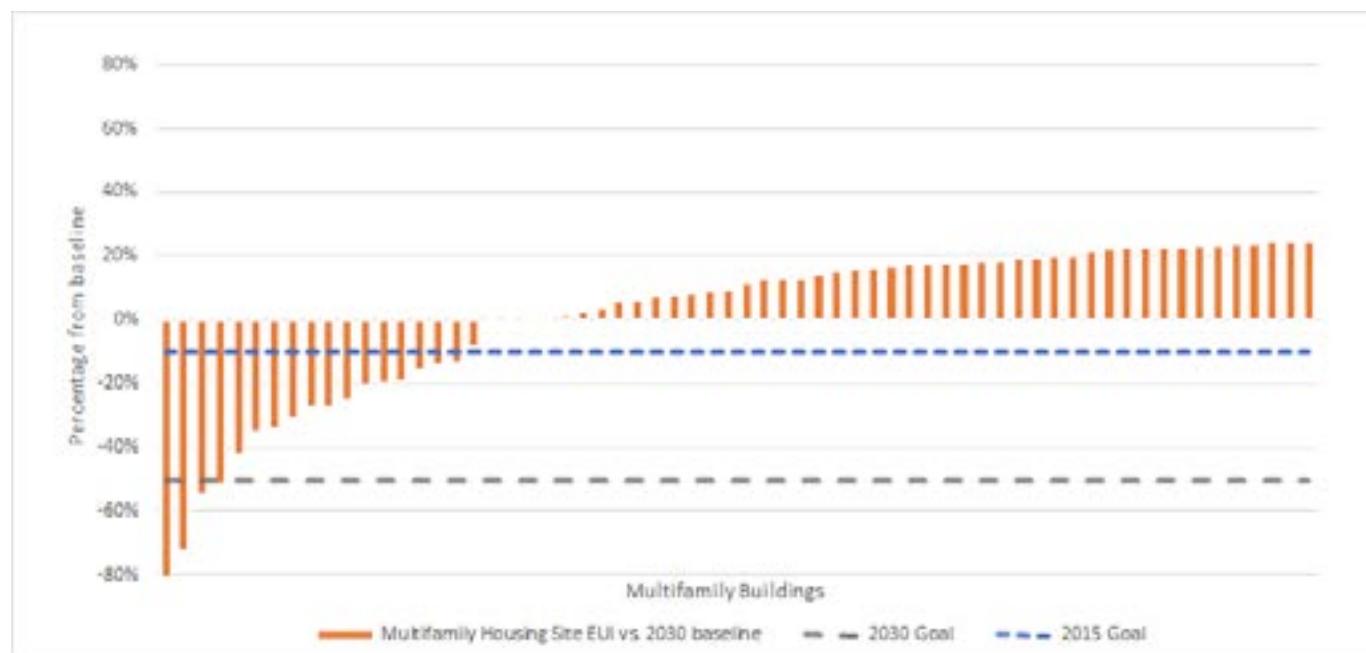


Figure 36: Percent Energy Reduction NYC 2030 District: Multifamily Housing > 50,000 sq. ft.

building, because it reflects more building-specific characteristics such as building type, floor area, and energy usage whereas the baseline used in Figure 37 (115.6 kBtu/sq.ft.) is mostly based on building type and floor area. Therefore, this sample building is actually performing 21.7% worse than the baseline (with its energy consumption), illustrated in Figure 38.

Figure 39 displays the potential cost savings derived from Portfolio Manager for the sample office building. By meeting the 2030 District goal, the sample office building can achieve a 13,410,560 kBtu energy reduction in 2030, which corresponds to approximately a \$630,000 reduction in energy cost.

Other District Goals:

Water Use

There is currently no national average/median for water consumption available, therefore local water consumption data for New York City were used to establish a district water baseline. The 2030 District goal is an immediate 10% reduction for existing buildings and an immediate 50% reduction for new construction and major renovations from the district average by 2015.

The LL84 Benchmarking Report provides annual water use intensity (WUI) for the years 2011 through 2013.

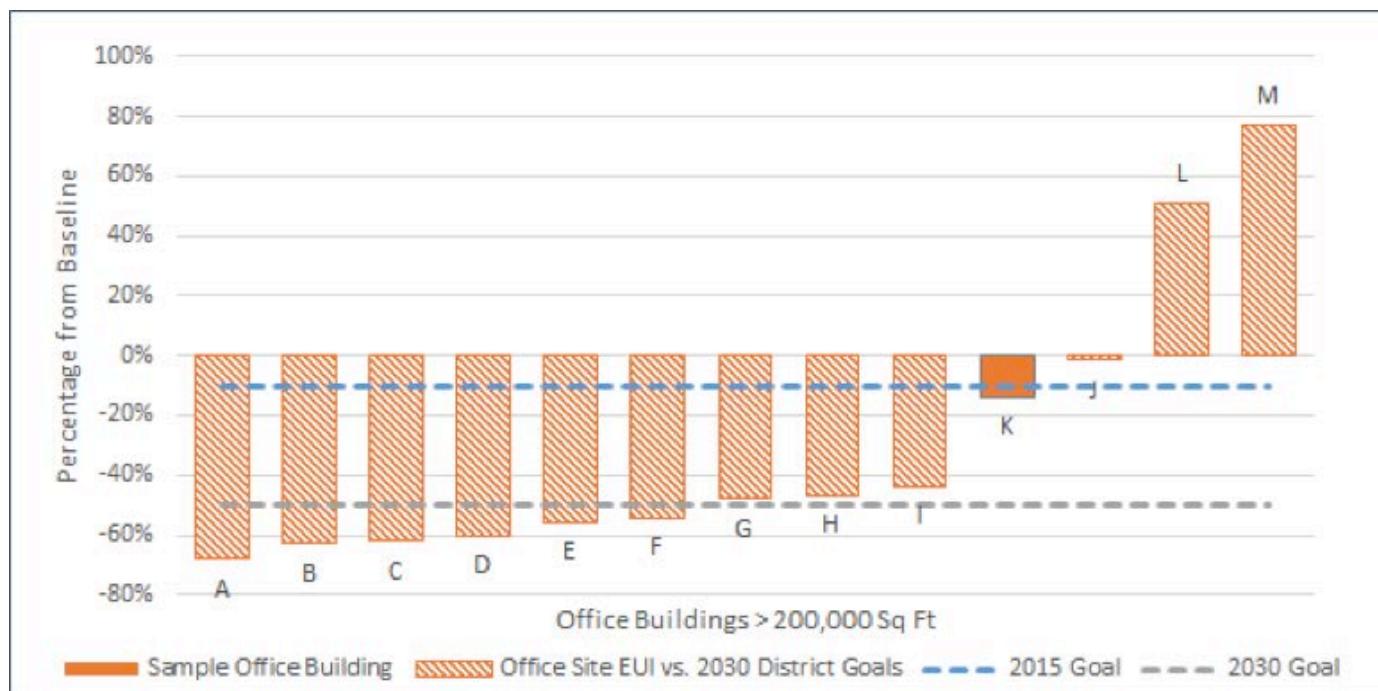


Figure 37 Percent Energy Reduction NYC 2030 District: Office Buildings > 200,000 sq. ft



Figure 38: Sample Office Building Energy Performance

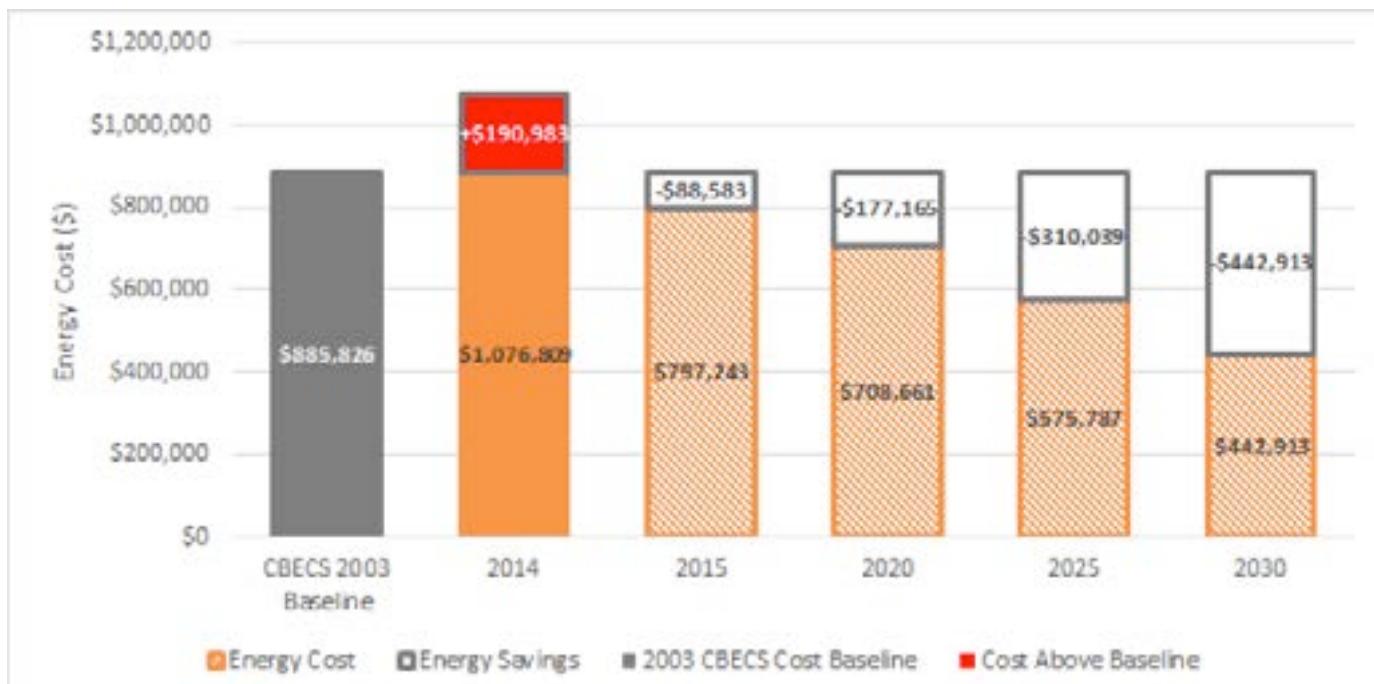


Figure 39: Sample Office Building Energy Cost savings

There are 211 properties within the NYC 2030 District reported to LL84 and, due to data availability and accuracy, the final dataset for water consumption included 100 buildings. The data are aggregated to establish a floor-weighted average WUI for the NYC 2030 District. The district-wide WUI average is the total water consumption reported (446,069,331 gal/yr) divided by the total square footage (14,799,961 sq.ft.) of the reported properties, which is 30.1 gal/sq.ft./yr. High average WUI indicates high potential water savings for the NYC 2030 District through water management.

One reason the NYC 2030 District has a relatively high average WUI is that 68% of the reported properties are multifamily buildings, hotels, and residence halls/dormitories. If reported properties could achieve a 50% reduction goal by 2030, the NYC 2030 District could reduce water consumption by 223M gallons per year by 2030, which is equivalent to the annual water consumption of 1619 households (assuming 125.8 gal/day/person¹⁰ and 3 people per household).

The average WUI for current reporting office properties is 25.2 gal/sq.ft. Eight office buildings that reported their water consumption to LL84 are located within the NYC 2030 District. Current water performance for office buildings is illustrated in Figure 40 and shows that 63% of reporting office buildings perform better than the NYC 2030 District baseline, and 50% of the reporting office buildings had already accomplished the 2030 reduction goal.

2030 Districts should explore other factors that affect building water consumption and normalize the baseline by occupancy, floor area, building type and operating

hours, similar to the methodology used by the EPA tool Portfolio Manager for energy. It should be noted that the current water baseline, 30.1 gal/sq.ft./yr., is an approximation based on the best currently available data. The baseline will be refined and developed as more water consumption data are collected. The NYC 2030 District should partner with the New York City Department of Environmental Protection (NYCDEP) in order to track more detailed and accurate historic water consumption of the district and develop a more refined water consumption baseline.

Transportation

The NYC 2030 District should also commit to a 50% reduction in emissions from transportation by 2030. New York City has one of the largest mass transit systems in the world. According to the 2014 New York City Greenhouse Gas Emission Inventory, the transportation sector contributes 24% of the city's total greenhouse gas (GHG) emission, which is equal to 11.4 million tCO₂e in 2013. NYC 2030 District members should take some responsibility for the transportation associated with their building to achieve the 2030 District goal for GHG emissions reduction from transportation. The baseline for the transportation performance metric should be based on the current district average. One potential method would be to use the Transportation 2030 Report methodology: transportation emissions is equal to the sum of total passenger emissions and total product-service emissions. The district should collaborate with the private sector and city agencies to gather and track data so that the baseline and performance for transportation emissions can be established.¹¹

Determining the baseline and tracking progress for transportation emissions can be challenging due to the fact that vehicles can travel in and out of the district boundary. There are a number of current benchmarking methods suggested by the Transportation 2030 Report to track transportation emissions within a given boundary. GHG inventories can be used to measure current emissions from the transportation sector while vehicle tracking systems and data loggers can be used to collect data such as miles traveled, fuel economy and type, and emissions.

Indoor Air Quality

The NYC 2030 District has the potential to improve indoor air quality within existing buildings. The district should consider a private, public or academic partnership to develop a guideline for its measurement, tracking and benchmarking. NYC's indoor air quality is critical since the majority of our time is spent indoors. A small-scale preliminary study, representing diverse building types and characteristics, and including air monitoring, equipment evaluations and recommendations for improvement, should be performed.

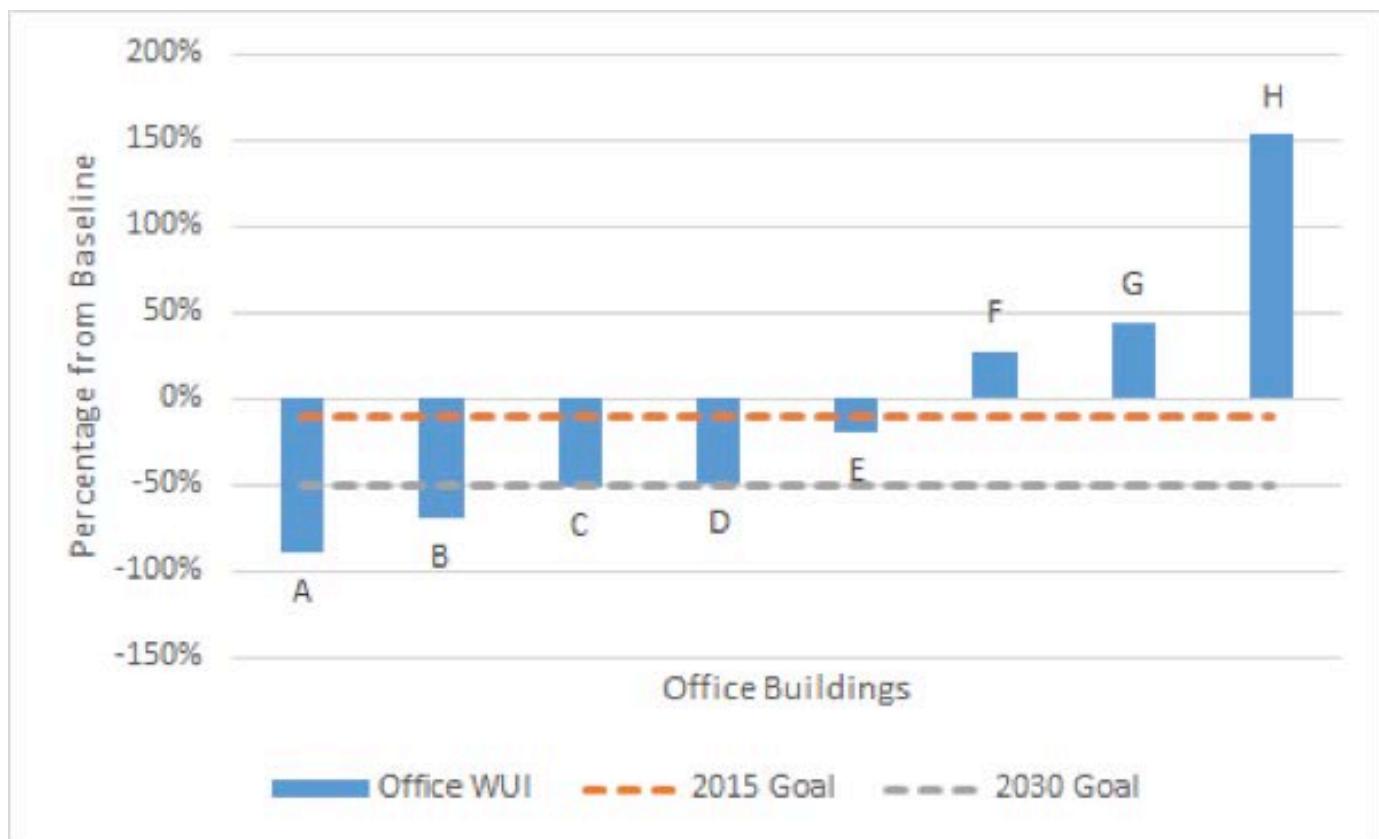


Figure 40: NYC 2030 District Water Performance

Conclusion

The energy baseline developed using the 2030 methodology is 76.8 kBtu/sq.ft. and the current NYC 2030 District EUI is 84.2 kBtu/sq.ft. for reported buildings in LL84.

The 2030 District EUI is similar to the average site EUI of multifamily properties: 85.0 kBtu/sq.ft. Since multifamily properties make up 59% of the total floor area of the district, this was expected. The other large space type in the NYC 2030 District is office buildings, which make up over 18% of the total floor area and have an average site EUI of 76.4 kBtu/sq.ft. These two space types allow for a more detailed comparison of building energy performance due to the large number of reported properties, and have the greatest potential for energy reductions in the NYC 2030 District.

With 130 reported multifamily properties in the district (BK CD 2), 85% of properties (53% of the reported floor area) are performing worse than the national median average. Buildings owners and professional and community stakeholders should take this opportunity to consider the improvements that can be performed in the multifamily sector. The Building Energy Exchange's Retrofitting Affordability Report aims to identify the greatest energy savings for a space type that makes up roughly 1.5B sq.ft. of the total building area in NYC.¹² The Retrofitting Affordability Report highlights some key energy conservation measures such as lighting, heating and several other energy conservation measures (ECM) for multifamily housing.

In general, most of the reported office properties (>200,000 sq.ft.) can meet the 2030 target reductions (-50%). However, the office baseline EUI (115.6 kBtu/sq.ft.) changes once individual building energy consumption data become available. With the sample office building, for example, the baseline EUI changed to 82.0 kBtu/sq.ft. It should be noted that the NYC 2030 District baseline should become more accurate as buildings report their individual annual energy usage in Portfolio Manager.

APPENDIX E

District interview details

Interviews with 2030 District leaders

Pittsburgh 2030 District: Anna Siefkin, Executive Director, interviewed on 6/4/2015

San Francisco 2030 District: Stan Lew, Executive Director, interviewed on 6/23/2015

Stamford 2030 District: Megan Saunders, Executive Director, interviewed on 5/28/2015

Seattle 2030 District: Matt Combe, Program & Operations Director, interviewed on 7/10/2015

Architecture 2030 Districts program: Vincent Martinez, Director of Development & Operations, 2030, Inc and Dave Low, Network Ambassador 2030 Districts, interviewed on 4/16/2015

Interviews with EcoDistrict leaders

Seattle Capital Hill Eco District: Joel Sisolak, EcoDistrict Director, interviewed on 8/22/2015

San Francisco SoMa Eco District: Jon Swae, SF City Planning Commission; Kate Magee, Pillsbury Winthrop Shaw Pittman LLP, interviewed on 7/21/2015

DowntownDC EcoDistrict: Scott Pomeroy, Sustainability Manager, Downtown DC Business Improvement District, interviewed on 7/21/15

Cambridge Kendall Square EcoDistrict: Jim Newman, Linnean Solutions, interviewed on 7/20/2015



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