Battery Park City Sustainability Plan

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

September 2020

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NEW YORK STATE OF OPPORTUNITY.

Battery Park City Authority

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September 2020

Version update in March 2022

Edits were made to 2017 and 2019 energy and GHG footprint data in the document as a result of adjusted methodology for GHG inventory calculations and corrections to data inputs and other calculations. Values were updated on pages 34, 35, 42, 46, and 48 and the target for E-2 was adjusted.

BPCA Sustainability Resolution

This Sustainability Plan lives in the context of decades of environmental leadership at Battery Park City, but also in recognition of the growing local, national, and global necessity for urban sustainability action. The 2019 Climate Leadership and Community Protection Act (CLCPA) has set mandates for NYS to reduce its greenhouse gas emissions, and the Battery Park City Authority will be on the leading edge of this ambitious effort. To that end, this Plan has been prepared in response to a charge by the BPCA's Board of Directors—its May 2019 Sustainability Resolution. The Resolution is excerpted below, and the full text is available here.

BE IT RESOLVED that by April 22, 2020 (Earth Day), it is anticipated that the Authority will create and submit to the Members for adoption a comprehensive sustainability plan and a uniform set of sustainability and energy efficiency guidelines, which will, among other things, set forth BPCA's commitment to develop and implement a road map to achieve a carbon neutral Battery Park City by the middle of the century, along with specific greenhouse gas reduction targets, a plan for achieving those targets, a plan for encouraging and supporting clean energy improvements, and a framework for ensuring BPCA lessees and business partners meet BPCA's enumerated goals; and be it further

RESOLVED, that, the President or her/his designee(s) be, and each of them hereby is, authorized and empowered, subject to applicable law, to enter into agreements, memoranda of understanding, and any other contract or document necessary, desirable or appropriate, with New York State and New York City agencies, authorities or entities necessary to access State and City resources, grants, monies, programs and personnel, and to otherwise effectuate BPCA's sustainability and energy efficiency goals; and be it further

RESOLVED, that, subject to any applicable provisions of the BPCA Procurement Guidelines, the President or her/his designee(s) be, and each of them hereby is, authorized and empowered to execute all such other and further documents and to take all such other and further actions as may be necessary, desirable or appropriate, in connection with the matters contemplated in this resolution.

George Tsunis, Chairman
Martha Gallo, Vice Chairman
Louis J. Bevilacqua
Donald A. Capoccia, Jr.
Catherine McVay Hughes
Anthony Kendall
Lester Petracca

Letter from the President & CEO

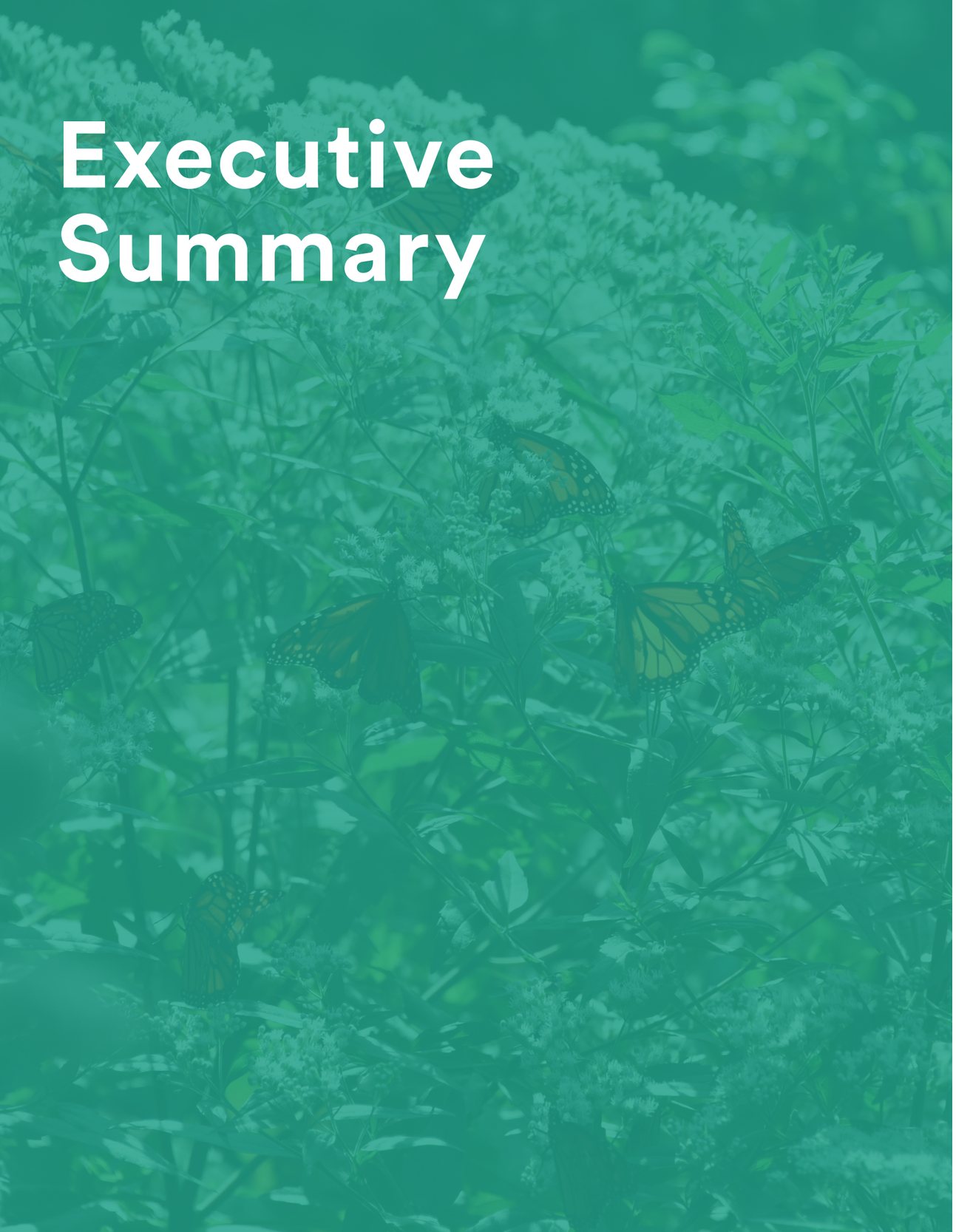
Even in the midst of present challenges, it is imperative that our commitment to greater environmental responsibility remains steadfast. The climate crisis necessitates urgent and ambitious efforts to transition to a low carbon future. The future depends on it. Healthier, more vibrant, and resilient communities require an array of actions, of which sustainability plays an important part. Battery Park City can serve as a model in this regard, as it has for decades now with trailblazing green building standards and environmentally-friendly parks operations practices. To that end, we've developed this neighborhood plan with energy, waste, water, and site management strategies to help advance our efforts and illustrate to others how it can be achieved.

This document, as well as the new Green Guidelines and Implementation Plan to come, would not be possible without the support of the State of New York and the leadership of our Board of Directors, valuable input of our Battery Park City Authority team, ideas from the local community and elected officials, and expertise from NYSERDA, NYPA, DEC, Mayor's Office of Sustainability, and Buro Happold.

It's fitting that this plan coincides with the 50th anniversary of Earth Day, and with it now in hand I hope that it informs how we approach our work in the days and years ahead.

With your help, we look forward to ensuring Battery Park City is built to last.

B.J. Jones
President & CEO



Executive Summary

1

Introduction

Battery Park City has a long history of environmental leadership. Since its inception, the parks and open spaces in Battery Park City were designed with environmental quality as a priority—for many, the quality of these spaces is the first thing that comes to mind when they envision the neighborhood. Starting in 2000, the Battery Park City Authority (BPCA) released environmental guidelines for residential buildings, leading to the development of buildings that were well ahead of city, and even global standards at the time. Two years later, similar guidance was provided for commercial buildings, with the original residential guidelines updated afterward. Decades of proactive leadership have resulted in Battery Park City being one of the most sustainable communities in New York City.

However, global challenges necessitate further action. The challenges—such as rising temperatures, constraints on water resources, and increasing amounts of waste—are problems that cannot be addressed by the Battery Park City Authority alone. The Battery Park City community has a part to play, and is in a unique position to leverage its global visibility and credibility as a successful urban district to showcase to New York City and beyond what compelling and equitable urban sustainability can look like.

In response to a resolution passed by its board in 2019, BPCA has prepared this ten-year Sustainability Plan to ensure that its environmental leadership continues for the next decade and sets the groundwork for continued progress for the years beyond. In the following sections, we invite you to learn about our Sustainability Vision, what we must do as a community to become more sustainable, and how we plan to do it.

Our Sustainability Vision is for Battery Park City to build on its past achievements and its freshly-articulated commitment to take and facilitate bold and effective action to effectuate environmental sustainability and rigorous greenhouse gas (GHG) reductions. Broad stakeholder engagement and creative partnerships will be necessary to achieve our goals. We will work together with diverse user groups in the community to realize these efforts across various scales—from individual action, to actions at a single building level, to actions taking place in the neighborhood at-large. Looking beyond our neighborhood, we seek to inspire, collaborate with, and offer guidance to other urban communities, whether new or well-established, to take resolute action on environmental sustainability.

Plan, Design, Implement

This ten-year Sustainability Plan is the first of three documents produced by BPCA as part of its overall program of sustainability efforts. The Plan sets a high-level vision for Battery Park City. The Strategies and Actions laid out in this Plan create a pathway to achieve progressive sustainability targets over the next decade, and lay the groundwork for continued sustainability action after 2030.

Later this year, the Plan will be joined by a set of two enabling documents. The new **Green Guidelines** will provide detailed guidance to BPCA and to Battery Park City building owners, managers, and tenants regarding the steps necessary to achieve a more sustainable Battery Park City. **The Implementation Plan** will outline the policies, programs, partnerships, tools, and funding mechanisms that are available, or can be created, to assist in transforming the Sustainability Plan into a reality.

Every Strategy and Action in the Sustainability Plan will be more completely documented in the Implementation Plan, providing a roadmap for realizing our Vision. BPCA will evaluate and track the community's progress toward achieving the goals of the Sustainability Plan. Through regular reporting and ongoing interaction between residents, employees, and visitors, the Battery Park City community will be continually engaged as active and accountable participants in the Sustainability Plan's success over the next ten years.

The Plan

The Sustainability Plan is centered around four Topic Areas: **Energy, Water, Materials and Waste,** and **Site**. Within these Topic Areas, there are **18 Strategies**—long-range approaches to achieve our higher-level Vision and Goals. Described within the Sustainability Plan are specific **Actions** and **Sub-Actions** for each Strategy—a total of 46 Actions and 142 Sub-Actions. Together, they respond to our three Goals (Resource Management and Reduction, Innovation and Inspiration, and Education and Collaboration) and chart a course toward making Battery Park City a model for sustainability.

Energy

In Battery Park City, building energy consumption is responsible for the majority of GHG emissions produced on-site. Recently-passed state and local laws have established mandates for reducing GHG emissions across all scales—from how energy is produced at a regional level to how it is consumed at a building level. The buildings in Battery Park City are more energy-efficient than typical buildings in New York City, but further improvements are required to meet the aspirations for a **carbon neutral neighborhood by 2050**.[1] To achieve these goals, the Energy Strategies in this Plan focus on reducing building energy consumption and switching to cleaner fuels.

Strategies:

- Deep energy retrofits
- Building electrification
- Low-carbon district energy systems
- Renewable energy supply and storage
- GHG emissions monitoring and reporting

Water

Reducing potable water consumption is key to enhancing the long-term sustainability of not just the community, but New York City. Because of their forward-thinking design, **buildings in Battery Park City already perform better than the city average**, but this performance is not uniform.[2] Mitigating the risks of flooding associated with sea level rise and major storms, like Superstorm Sandy, is the main focus of the ongoing BPC Resiliency Projects. Managing stormwater resulting from "everyday storms" is also important for Battery Park City to be better stewards of the environment, especially considering its waterfront location along the Hudson River. The Water Strategies in this Plan focus on improving the way buildings, parks, and open spaces both consume and respond to water.

Strategies:

- Water conservation
- Water recycling systems
- Resiliency and stormwater management

Materials and Waste

For most of us, our first exposure to individual sustainability action is through recycling and composting. We learn about it in school, and it becomes part of our daily choices often without thought. Waste has a **significant impact on the urban environment and public health**, as well as on GHG emissions. In this Plan, Materials and Waste Strategies focus on the items we bring into and use in the neighborhood and the ways we handle and dispose of waste, as well as other special considerations such as mitigating the impacts of construction.

Strategies:

- Sustainable consumption
- Sustainable building materials
- Waste diversion
- Organics collection and composting
- Construction and demolition activities

Site

Many people experience Battery Park City through the streets and sidewalks, the parks, the Esplanade, and other open spaces. Improving sustainability for these spaces will **improve health and wellness and make Battery Park City an even more desirable place** to live, work, and visit—as well as a safer place to walk around and bike. With the goal of improving the overall quality of life, the Site Strategies in this Plan focus on the broader health and ecological and environmental quality issues in Battery Park City.

Strategies:

- Biodiversity and habitats
- Quality of life
- Environmental monitoring and data sharing
- Active transportation
- Electric vehicle infrastructure

Connect and Engage

Looking beyond this document, we invite you to learn about and engage with the Sustainability Plan at: www.bpca.ny.gov

Introduction

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Sustainability Call to Action

A sustainable Battery Park City is one that strikes a balance between environmental and personal health and wellbeing on the one hand, and growth, progress, and economic success on the other. The scope of sustainability-focused action is **wide-ranging and inherent in everything we do**—from small decisions like recycling a water bottle to bigger investments like installing solar panels.

Sustainability is aligned with the concept of climate action, or action taken in response to accelerating changes in the global climate. As our climate changes, storms intensify in strength and frequency, temperatures get more extreme, and the pace of large-scale physical devastation, ecological and social disruptions, and negative health impacts quickens. **We are responsible for acting now to reduce GHG emissions and limit the negative impact we have on the climate**.

Looking at the science, the time to act is now. The Intergovernmental Panel on Climate Change (IPPC) released a special report in 2018 that describes the future we face if we limit global temperature increase to 1.5˚C above pre-industrial levels and the scenario if temperatures increase to 2˚C above pre-industrial levels. The difference between these two scenarios is stark, and we must do everything in our power to limit GHG emissions and avoid the worst-case scenarios. Extreme heat, sea level rise, receding arctic ice cover, species loss, and diminishing crop yields are all among the factors impacted by climate change and are set to have extreme, negative impacts on our environment if we don't act now. **A low carbon future is our only hope for creating a world that is sustainable, healthy, and safe.**

Around the world, governments, NGOs, companies, and individuals are taking action to understand their impact on global GHG emissions, changing their behaviors, and mobilizing together to minimize emissions. New York State has set ambitious targets to reduce its GHG emissions by 40% by 2030 and 80% by 2050 from 1990 levels. The State's latest sustainability effort, the Green New Deal, accelerates the state's action by aiming to achieve 70% renewable electricity by 2030 and 100% carbon-free electricity by 2040. By aiming for net zero carbon by 2050, Battery Park City is aligning itself with New York State efforts and other global leaders, committing to prioritize climate action. **Working together, our local actions will have a global impact.**

Informed by its ten-year Sustainability Plan, Battery Park City Authority will act to reduce GHG emissions and tackle sustainability issues while collaborating and sharing lessons learned with the wider NYC community and other communities around the world. To realize the vision of a more sustainable Battery Park City, we will need action at the Authority level, the building level, and the individual level. At each level, decisions can be made to lighten one's touch on the environment and **ensure that the neighborhood thrives for years to come** as a healthy and desirable setting for living, working, and playing.

Battery Park City's Green Legacy

Battery Park City stands where there once was a collection of piers in the Hudson River off Manhattan's lower west side that had fallen into disrepair. In their place, a new neighborhood was born—a "city within a city." Envisioned as an extension of Manhattan's street grid that prioritized open space, Battery Park City today has over 22 million square feet of building area interspersed with 36 acres of parks and open spaces.

The scale and success of the Battery Park City development has become a model for urban mixed-use development in New York City and beyond. Battery Park City is globally known, but not just because it is in New York, nor because of its scale or diversity of land uses or its exemplary parks. What stands out more and more each day, especially in the context of global environmental and climate challenges, is its story of environmental stewardship and leadership in urban sustainability.

Battery Park City is managed and maintained by the Battery Park City Authority (BPCA), a New York State public benefit corporation, and the landowner for the 92-acre neighborhood. BPCA is much more than just a landlord—through its open space management, active program of maintenance and improvements, and site programming, BPCA has guided Battery Park City to what we know it as today: a sustainable urban development with a high quality of life. This Plan follows a long line of achievements in sustainable practices and creative and responsible urban land development, and proactively responds to the challenge to make the state carbon neutral by 2050 (the 2019 Climate Leadership and Community Protection Act).

The timeline on the opposite page highlights some milestones from the community and BPCA's shared legacy of environmental stewardship over the past several decades. In this context it is important to highlight that the commitments in this Sustainability Plan are more than just aspirational statements; they are a roadmap for action. For example, just last year (July 2019) BPCA issued $76.3 million in Sustainability Bonds to fund Phase 1 of its Capital Plan, which included the development of flood resiliency infrastructure and public space enhancements for accessibility and walkability.

South Cove

1950s — **20 dilapidated piers** in the Hudson River, where Battery Park City now stands, handled produce for the now-defunct Washington Market

1968 — **The Battery Park City Authority Act** creates BPCA as a New York State public benefit corporation

1970 — Demolition begins—the first pier is demolished

1976 — Landfilling is completed, allowing for development to commence

1979 — **The 1979 Master Plan** lays out a vision for Battery Park City as an extension of the existing NYC grid

1980s — Battery Park City begins its build out, with 12.9 million SF of building space coming online

1982 — **The first residents move into Battery Park City, at Gateway Plaza**

1987 — **BPCA formalizes and expands organic landscape management** practices of parks and open spaces in Battery Park City

1990s — Battery Park City's roads and infrastructure are built out to support increased development, with 2.5 million SF of new construction

1997 — Opening of the Museum of Jewish Heritage, which uses electric-only systems for heating and hot water

2000s — BPCA oversees the development of 6.2 million SF of new construction

2000 — **BPCA issues the Residential Environmental Guidelines,** setting standards for environmental design well ahead of current design practices

2002 — The Commercial/Institutional Environmental Guidelines are issued

2004 — **The Solaire becomes the first LEED Certified** high rise residential building in the United States

2005 — The Residential Environmental Guidelines are updated, with insights from the Solaire and in response to advances in the field of green development

2008 — P.S./I.S. 276 opens as the first LEED Certified school in New York City

2010s — Against a background of an additional 680,000 SF of new construction, BPCA integrates sustainability into public events, outreach, and neighborhood-wide initiatives

2012 — Storm surge and extreme rainfall from Superstorm Sandy inundates Lower Manhattan and parts of Battery Park City

2017 — Following expansive local site assessments, design begins for the South BPC Resiliency Project, the first of four projects intended to protect the neighborhood from flood events

2019 — **BPCA releases the** Resilience Action Plan, a strategic plan which outlines how Battery Park City will be an inclusive community, safe and climate resilient place, remain a vibrant public space, and how BPCA will provide leadership along the way

2020 — **BPCA issues $76.3 million in Sustainability Bonds** to fund Phase 1 of its Capital Plan, and updates its Investment Guidelines with environmental, social, and governance (ESG) factors

The BPCA Board of Directors passes the Sustainability Resolution, the impetus for this Sustainability Plan

BPCA's 75 Battery Place headquarters receives Zero Waste Certification from TRUE, recognizing BPCA's efforts of minimizing and managing the materials it uses and the waste it produces

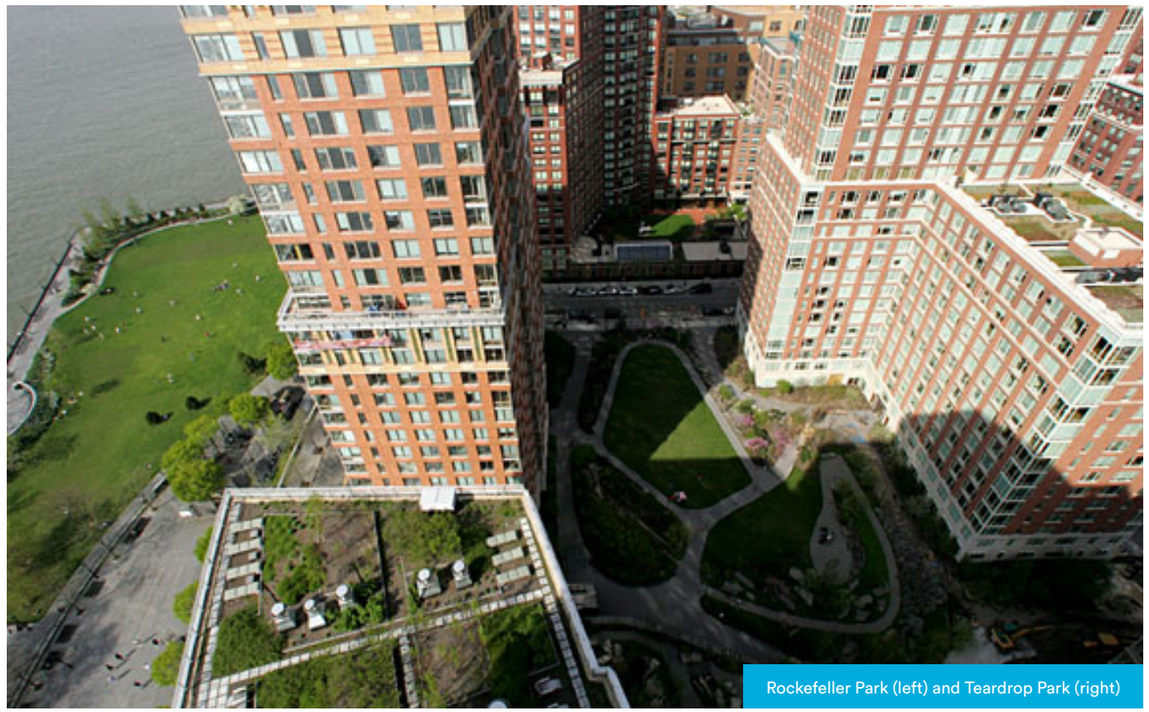
This 10-year Sustainability Plan is released on Earth Day, April 22, to be followed later this year by the new Green Guidelines for building and site retrofits, and the Implementation Plan outlining the pathways toward a sustainable future

Sustainability Vision

The Battery Park City Authority continues to be a leader in sustainability and, through this plan, will identify new pathways and strategies for making Battery Park City an exemplar of urban sustainability. Through the Sustainability Plan, new Green Guidelines, and Implementation Plan, Battery Park City is committing to more precisely define, enhance, and measure its sustainability objectives and achievements over the next ten years. Battery Park City will focus on efforts like deep energy retrofits and clean power, water conservation, organic waste collection and composting, resiliency and biodiversity—while in the process moving the community closer to carbon neutrality by 2050.

The substance of BPCA's three-part sustainability platform was informed through stakeholder engagement and existing conditions assessments that shed light on the potential of Battery Park City's future. As a result of these actions, this Plan establishes a vision for the neighborhood that will set the stage for the next decade as we work together to protect and enhance our shared environment.

We envision a Battery Park City that will serve as an innovative model for urban climate action, where all of us who live, work, and spend time here mobilize to create a sustainable future.



Rockefeller Park (left) and Teardrop Park (right)

Battery Park City will focus on urban sustainability.

Goal 2.2 of Battery Park City's 2019 Resilience Action Plan established a goal to achieve a carbon neutral Battery Park City by 2050. While this goal is a key driver for sustainability action in Battery Park City, the Sustainability Plan puts forth a holistic vision of environmental sustainability, including health and wellness, environmental quality, and education.

Battery Park City will ensure that changes are made in harmony with the environment.

As a waterfront community with public parks and green spaces that are core to its character, preserving the environment is a priority for Battery Park City. Through the Sustainability Plan Actions and a clear focus on environment quality, Battery Park City will care for and maintain a clean, thriving, and biodiverse environment for all to enjoy.

Battery Park City will collaborate with those who live, work, and spend time here.

BPCA cannot achieve a sustainable and carbon neutral Battery Park City alone. All stakeholders will need to act to achieve the Vision and Goals in this Plan and to foster a more sustainable neighborhood.

Battery Park City will continue to be an inspiration for other urban developments.

With a variety of residential rental, condo, co-op, commercial, retail, cultural, educational, and institutional stakeholders, Battery Park City will achieve a set of progressive sustainability goals that will provide guidance and case studies for other communities to replicate.

Sustainability Goals

Three sustainability Goals were developed as pillars for action at Battery Park City. These help to formalize the Vision and provide direction for the Strategies and Actions. The sustainability Goals are: **Resource Management and Reduction**, **Innovation and Inspiration**, and **Education and Collaboration**.

Lily Pond

Resource Management and Reduction (RM&R)

Reduce the demand for energy and water, promote the creative reuse of resources, strengthen Battery Park City's resilience, enhance its ecosystems, and minimize waste to reduce its environmental footprint.

Environmental responsibility is a key component of BPCA's mission, as reflected through its history of adopting and advancing standards and practices for sustainable development. BPCA Parks Operations has incorporated environmental responsibility into its operations since inception, developing and enhancing sustainable landscape and maintenance techniques for more than 20 years.

In the past decade, there have been significant advancements in sustainable infrastructure practices and technologies, and a major shift in public attention toward the threat of climate change and the necessity of mitigation and adaptation. Resource consumption—including energy, water, and materials—is the driving force behind climate change and lasting damage to our ecosystems, and must be dramatically altered to reduce these impacts.

Guided by the Sustainability Plan, Battery Park City will work toward true resource efficiency, eliminating wasteful and high environmental impact consumption patterns in pursuit of driving the environmental footprint of Battery Park City down to zero—centered on a 2050 carbon neutrality goal. In parallel, the Actions outlined in this Plan will improve the quality of life in the buildings and parks and open spaces in the neighborhood, while simultaneously seeking to reduce long-term costs for building owners and tenants.

BPCA will lead by example by providing access to information on service providers, educational, and financing opportunities. BPCA will also promote existing support systems and form new partnerships to encourage and, in some cases, incentivize all who live in, work in, and visit Battery Park City to lessen their own environmental footprint and work together toward a sustainable future.

Innovation and Inspiration (I&I)

Leverage Battery Park City initiatives as scalable models for sustainability to reduce the neighborhood's carbon footprint and inspire urban communities across the world to accelerate environmental action.

As a “city within a city,” Battery Park City can serve as a testing ground for scalable and replicable sustainability initiatives. Battery Park City has a mix of building types and public open spaces. The majority of buildings were developed in the last 20 to 30 years, and parks and open spaces were planned and designed in a coordinated manner pursuant to the 1979 Battery Park City Master Plan.

From its headquarters at 75 Battery Place and 200 Liberty Street, BPCA stewards its parks and open spaces; programs myriad community events; liaises with property owners, tenants, and visitors in the neighborhood; plans, finances, and manages capital construction and maintenance projects; and much more to maintain the neighborhood as a global example of mixed-use urban development with an excellent quality of life.

The scale of BPCA’s guidance and action will vary. BPCA can establish its own spaces as best-in-class examples of sustainable operations to promote individual behavioral changes. Any retrofits or management changes to BPCA spaces will become the “gold standard” to which all other commercial building spaces in the neighborhood should aspire. Similarly, BPCA can encourage their own employees to discover the opportunities and challenges of changing individual behaviors—taking this knowledge and promoting sustainable behaviors across the diverse user groups in the neighborhood.

BPCA can serve as a central facilitator of sustainability by establishing both physical infrastructure and programs, or “soft systems” to assist property owners, tenants, and visitors to meet the targets in this Sustainability Plan. In managing these projects and programs, it is envisioned that BPCA will become an aggregator of consumption and sustainability data, tracking its progress toward the targets in this Plan and reporting this progress back to the community.

Strategies BPCA implements in its own spaces, or enables in the neighborhood at-large, will become part of a set of new best practices for urban climate action. BPCA will partner with government agencies, professional organizations, and NGOs to share case studies with the broader design and sustainability planning community, ensuring that the story of Battery Park City is understood as a replicable model for other urban communities, in New York and beyond.

Education and Collaboration (E&C)

Bolster engagement and education throughout Battery Park City on sustainability-related issues while ensuring the benefits of actions taken are shared, including improved environmental quality, reduced utility and operational costs, and improved quality of life.

Engagement is a primary tenet of sustainability for BPCA. An engaged community is stronger, more resilient, and more effective at adopting change. Throughout the development of this Sustainability Plan, a variety of stakeholders were engaged to understand their individual priorities, preferences, and ideas. Equipped with this stakeholder input, we have developed a Plan that is grounded and realistic for implementation, but innovative enough to accomplish our sustainability goals.

We cannot achieve our goals without the collaboration of those who live in, work in, and visit Battery Park City. Many of the Strategies and Actions proposed in the Sustainability Plan are centered around behavioral change. Enabling Battery Park City community members through education to make conscious choices to consume fewer materials, recycle, conserve energy and water, ride public transit, and promote green spaces will not only improve our environment but also save money and create a better quality of life.

BPCA will act as a sustainability educator and develop events and outreach materials that keep the neighborhood aware of opportunities and tuned in to their role in promoting sustainability. BPCA will leverage its programming abilities to engage the various constituencies of Battery Park City and ensure they understand our pathways to the future and their role in achieving neighborhood-wide goals.

The benefits of greater awareness and understanding will be powerful collective action around sustainability, including cleaner air, less polluted streets, improved health and wellness, a sharing culture, reduced utility and operational costs, improved resilience, and a higher quality of life. The hard work associated with changing our buildings, public and private spaces, and behaviors will benefit us all with an improved Battery Park City.

Community Engagement

The Sustainability Plan's release follows a comprehensive stakeholder outreach and engagement initiative, which gave shape to a collective sustainability vision for Battery Park City. Looking toward the future, it will be important to sustain open and active dialogue. BPCA will continue to facilitate engagement with a range of neighborhood stakeholders for discussions and activities, as well as offer training and assistance, as the Strategies in this Plan are brought to fruition through actions by individuals and building owners alike.

Over three months, almost 500 people participated in the development of this Sustainability Plan, with public roundtables, pop-ups at public events and in the BPCA offices, and an online survey. This approach solicited ideas from the public and from BPCA staff for inclusion in this Plan—**35% of the Plan Sub-Actions came directly from these engagements**—as well as helped BPCA identify where there is opportunity to increase awareness, seek collaborations, and facilitate programs to promote sustainability.

During this process, some key themes emerged, which have shaped the Strategies in this Plan and will inform the intent and execution of its supporting documents to be released later this year—the new Green Guidelines and the Implementation Plan.

- **Pride:** Stakeholders are proud of current initiatives and aspire for both the community and BPCA itself to set new benchmarks and standards that push the envelope further than current best practices.
- **Visibility:** Stakeholders want to prioritize highly-visible strategies that can encourage the sense of "we're in this together" and motivate collective action.
- **Education:** Stakeholders consider ongoing education as a way to inspire a wider mindset and foster behavior change and cultural shifts.
- **Priorities:** Stakeholders indicated that promoting deep energy retrofits of existing buildings, organics collection and composting, low-carbon district energy systems, active transportation, and biodiverse and resilient landscape were all high-priority areas.
- **Partnerships:** Stakeholders stressed the importance of establishing creative partnerships and unique funding models that leverage City and State resources and programs. There was the desire to establish partnerships with BPCA across condo boards, building managers, schools, and other stakeholders.

The BPC Sustainability Plan, and the forthcoming Green Guidelines and Implementation Plan, was also informed by an robust interagency working group. The **Battery Park City Carbon Neutral Working Group** is made up of representatives from New York State Energy Research & Development, New York Power Authority, Con Ed, Department of Environmental Conservation, and the Mayor's Office of Sustainability.

The Plan

Plan Organization

The Plan is organized into six main chapters:

Chapters 1 & 2
Executive Summary and Introduction
(Page 10)

Chapter 3
Energy Strategies and Actions
(Page 34)

Chapter 4
Water Strategies and Actions
(Page 52)

Chapter 5
Materials & Waste Strategies and Actions
(Page 66)

Chapter 6
Site Strategies and Actions
(Page 84)

Elements of the Plan

This Plan is categorized by Topic Areas that serve as the main chapters of this report. As the Plan is read, Topic Areas are further broken down into broad aspirations and discrete methods for achievement. In that spirit, the Sustainability Plan is divided into **Strategies**, **Targets, Milestones**, **Actions,** and **Sub-Actions**.

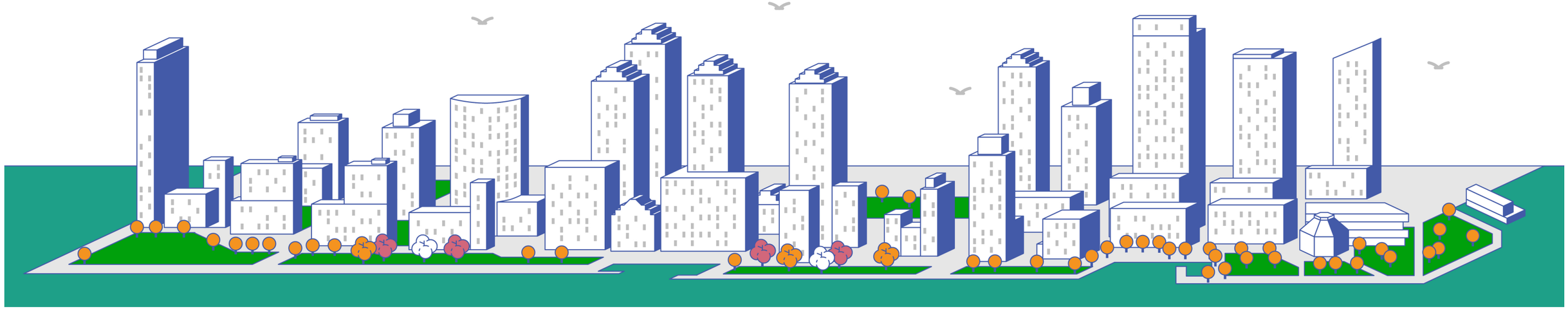
18 **Strategies** are primary methods for achieving Battery Park City's sustainability goals and include deep energy retrofits, organic waste collection, etc.

25 **Targets** are the objectives set to achieve each Strategy within the next 10 years (by 2030). These Targets are either **BPC Targets**, those that will be achieved neighborhood-wide, or **BPCA Targets**, those that will be achieved in BPCA-owned and leased spaces (both indoor and outdoor) as it leads by example.

64 **Supporting Milestones** are placed along a timeline over the next ten years which BPCA will track to illustrate progress toward meeting the 2030 Targets.

46 **Actions** provide more detailed initiatives that will be implemented underneath each Strategy for the purposes of achieving the Targets. Actions can be **BPCA-led Actions**, those that will be primarily implemented and managed by BPCA; **BPC-wide Actions**, those that will be implemented across Battery Park City and require collaboration with all buildings and major stakeholders; or be **shared by both** BPCA and the community at-large.

142 **Sub-Actions** are the implementation steps to support each Action. The Sustainability Implementation Plan will further elaborate on these Sub-Actions.



How to Read this Plan

Strategy reference number

Goals relevant to each Strategy

Indicates primary responsibility for a Sub-Action sits with either BPCA or the BPC community at-large, or is shared

Strategy Name

Strategy Description

2030 Targets

Supporting Milestones

Additional achievements to measure and track on the path toward fulfillment of the 2030 Targets

Waste diversion [M&W-3]

RM&R E&C

Strategy Description

Increase the amount of reused and recycled materials, and separately dispose of organic waste, to reduce the amount of waste sent to landfill and the associated GHG emissions

Across Battery Park City, there are initiatives to reduce the amount of waste sent to landfills. Programs include drop-off locations for organic waste, on-site composting, and reuse and recycling programs. In Battery Park City, it is estimated that 85% of all waste generated is currently sent to landfill, while—based on the composition of the neighborhood's waste—there is potential to send only 18% to landfill. Central to achieving this goal is to promote reuse with centralized locations for donations and material reuse that act as educational opportunities for people to learn how to properly dispose of items. Targeted events that promote the reuse and donation of certain items can activate Battery Park City to engage with the programs. By emulating BPCA's efforts to be a Zero Waste organization, awareness and education of waste issues and opportunities will be stimulated across the neighborhood.

2030 Target

Battery Park City Authority Spaces

Target: Zero waste sent to landfills from BPCA-managed spaces by 2030

Baseline: 90% of 75 Battery Place waste was diverted from landfills in 2019[29]

Battery Park City

Target: 50% reduction in landfill waste sent to compactors by 2030

Baseline: 8.5 million pounds of residential landfill waste compacted in 2019[30]

Supporting Milestones

Actions

	BPCA-led	BPC-wide
Support the development of reuse centers and educational programs across Battery Park City to influence behavior change		
• Host events for people to bring atypical waste and learn about options for reuse, donation, or recycling (E)	✓	
• Host reuse events like a costume swap, a drop a bag, take a bag event, or fix it events where broken items can be brought in for repair rather than being thrown away (E)	✓	
• Donate unused food from food retailers and restaurants		✓
Expand recycling and composting activities through additional infrastructure, education, and training		
• Develop consistent signage for waste, recycling, and organics collection across Battery Park City (E)	✓	
• Pilot recycling bins in parks to assess the impact on waste diversion (E)	✓	
• Develop an education program to raise awareness about available recycling and composting programs and how community members can contribute	✓	
• Train at least one building management staff member for each building to achieve the NYC Zero Waste Building Maintenance Training Certificate, or similar (E)		✓
• Enroll in optional recycling programs such as e-waste recycling and clothing donations (E)		✓
• Identify creative ways to reduce the amount of waste sent to landfill by BPCA Parks Operations and Parks Programming events (E)	✓	
Conduct waste audits and collect waste data to better understand diversion and track progress	BPCA-led	BPC-wide
• Conduct regular audits of residential waste sent to compactors and public trash cans throughout the neighborhood, and report findings to residents and building owners (E)	✓	
• Pilot weighing all building waste brought to BPCA compactors on a regular basis (E)	✓	
• Conduct regular waste audits of commercial properties and tenant spaces (E)		✓
• Send waste in clear bags to compactors to allow for a visual check for contamination		✓

Art Programs Reuse Materials

Parks Programming regularly reuses and repurposes materials such as plant clippings from the parks and discarded newspapers, scrap paper, and boxes from deliveries for art programs. BPCA programs and event guides are also printed on 100% recycled chlorine-free paper with soy and vegetable ink, and leftovers are recycled to create seed paper.

Actions

Underlined words can be referenced in the Glossary (see Appendix)

Actions

Sub-Actions

(E) Items suggested during stakeholder engagement or at BPCA internal pop-ups

BPCA existing practice highlights and fun facts about Battery Park City

Energy

3

Energy at-a-glance

In Battery Park City, energy consumption within buildings is responsible for the majority of greenhouse gas (GHG) emissions produced on-site and is the primary focus of the energy strategies in this Plan. In an effort to move Battery Park City closer to net zero emissions by 2050, these strategies will be critical for success. In this Plan, the Energy topic area includes energy consumption, generation, monitoring and management, as well as strategies for GHG emissions monitoring and reporting.

The Verdesian has solar panels integrated into the building facade

Energy Use

Buildings in Battery Park City consume more than 2.1 million MMBtu of energy annually.[3] Commercial office properties are responsible for the largest share of building energy consumption within Battery Park City, consuming more than 1.3 million MMBtu of energy annually, followed closely by residential multifamily properties, which consume nearly 716 thousand MMBtu annually, with the remainder of consumption by institutional properties (schools, museums). On average, Battery Park City buildings consume approximately 30% less energy than New York City buildings on a per square foot basis.

GHG Emissions

In 2017, Battery Park City buildings were responsible for producing approximately 148,000 tons (carbon dioxide equivalent, or tCO2e) of GHG emissions annually, equivalent to the emissions of driving 372 million miles.[4] The majority of these GHG emissions are produced by commercial office properties and multifamily residential.

In April 2019, the New York City Council adopted Local Law 97, which establishes GHG emission limits for existing buildings greater than or equal to 25,000 square feet in gross floor area. Emissions limits are assigned by building occupancy classification and are incrementally reduced over time. For buildings that are non-compliant, there is a $268/tCO2e fine, applied annually for the emissions produced over the limit. The first compliance period for Local Law 97 runs from 2024 through 2029, and the second runs from 2030 through 2034. A third compliance period, from 2035 to 2050, is identified, but specific GHG emissions limits are not yet established for building occupancy types.[5]

A majority of Battery Park City buildings are likely to remain within the GHG emissions limits established for the 2024–2029 period if their current performance is maintained. However, nearly 90% of buildings are projected to exceed 2030–2034 GHG emissions limits once they become effective. If no action is taken, the fines for non-compliance could total approximately $7.5 million annually for Battery Park City building owners.[6]

2.1
million MMBtu
the amount of energy consumed by the buildings in Battery Park City every year

148
thousand tCO2e
in GHG emissions are associated with the buildings' annual energy consumption of fuels and electricity

90%
of buildings
are projected to exceed the City's 2030-2034 GHG emissions limits under Local Law 97

Energy Supply

Electricity, natural gas, and district steam comprise the majority of energy used in Battery Park City buildings. To achieve carbon neutrality, we must replace fossil-fuel based energy sources with an energy supply that does not emit GHG. This transition in Battery Park City relies on three components: retrofitting buildings, transitioning buildings off of fossil fuel supply to all-electric systems, and transitioning to an electricity supply that comes entirely from clean sources. New York State has committed to rapidly decarbonizing the electric grid through the Climate Leadership and Community Protection Act (CLCPA), which targets 70% renewable energy for the state electricity supply by 2030. The New York State Energy Research and Development Authority (NYSERDA) is also working to accelerate the transition through programs and incentives designed to remove barriers to clean energy development.

Off-site Renewable Energy Procurement

The vast majority of electricity consumed in Battery Park City is generated off-site, and the carbon emissions associated with that electricity is dependent primarily on the electricity generation mix of New York State. In 2018, approximately 26% of New York State's electricity came from renewable energy/power sources.[7] The CLCPA requires utilities to source 70% of the state's electricity from renewable energy by 2030. New York City has also set new renewable targets, including achieving 1,000 MW of solar capacity by 2030 and 100 MWh of energy storage by 2020.[8]

BPCA purchases electricity from the New York Power Authority (NYPA), which is served by a modern generation facility in Queens. The rest of Battery Park City is served by ConEd and has the option to purchase supply from them or any other energy service company (ESCO) operating in the New York market. BPCA, and buildings in Battery Park City, can help to accelerate the grid transition to clean energy by selecting ESCOs that provide renewable energy and encouraging residents and commercial tenants to switch to them, where feasible.

THE RECENTLY-ENACTED NEW YORK STATE CLCPA REQUIRES UTILITIES TO

source 70% of electricity

FROM RENEWABLE SOURCES BY 2030

Distributed Energy Generation

New York State and New York City are working to accelerate the development of small-scale distributed energy generation such as solar photovoltaic (PV), battery storage systems, and decentralized energy distribution networks for electric and thermal power. By expanding these systems and developing new ones, Battery Park City can ensure a consistent renewable energy supply at a fixed energy price that contributes to carbon reduction goals and resiliency.

There are currently 348 kW of solar PV (mostly in the form of building integrated PV systems, or BIPV), two cogeneration plants, two natural gas fuel cells, and a district heating and cooling system within Battery Park City. Exploring opportunities to expand on- and off-site distributed generation will form a key part of the drive toward carbon neutrality in Battery Park City.

Energy Highlights

- Solar PV or building-integrated PV (solar facades)
- LEED Certified buildings
- 1 The Solaire was the first LEED Certified high-rise residential building in the United States
- 2 Brookfield Place relies upon a district steam network, using ConEd steam

Energy Strategies

Strategy 1: Deep energy retrofits

Strategy 2: Building electrification

Strategy 3: Low-carbon district energy systems

Strategy 4: Renewable energy supply and storage

Strategy 5: GHG emissions monitoring and reporting

Deep energy retrofits

[E-1]

RM&R I&I E&C

Strategy Description

Upgrade building facades, windows, and mechanical systems to reduce building energy consumption and costs, reduce GHG emissions, and meet NYC building emission compliance targets ahead of the current deadlines

With the passage of the New York City Local Law 97, the majority of buildings in Battery Park City will need to lower their emissions by 2030 to avoid fines. Buildings will need to undergo deep energy retrofits, including measures such as building envelope (facade/window/insulation) improvements and HVAC systems upgrades. There are economies of scale that can be pursued in the procurement of equipment and services among the buildings and systems in Battery Park City, as well as opportunities for knowledge transfer. BPCA will identify "prototype" buildings and retrofit strategies that can serve as testbeds in the development of technically- and economically-viable retrofit pathways for Battery Park City. An improved understanding of the energy consumption in Battery Park City will also be required to inform retrofit strategies and to improve energy-related operation and maintenance practices. Battery Park City is currently being equipped with smart meters (through ConEd), but additional information may come from the installation of building energy information systems, and sensors and controls to further raise awareness of energy consumption and allow for more targeted control of systems and equipment.

2030 Target

Battery Park City Authority Spaces

Target: All BPCA indoor spaces will achieve net zero emissions by 2025 by prioritizing local renewable generation

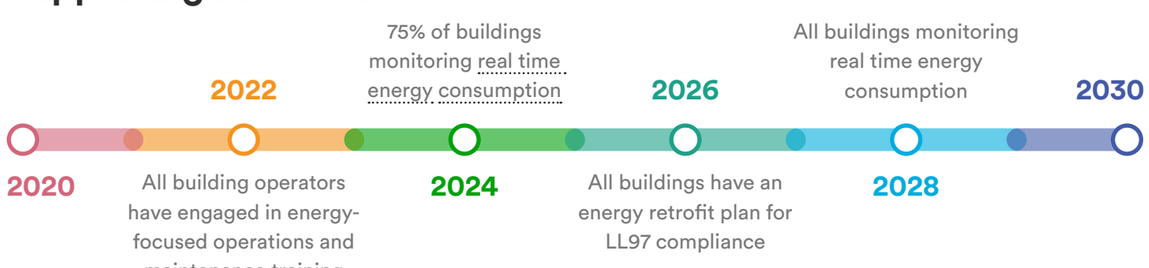
Baseline: In 2019, BPCA indoor spaces had a carbon footprint of 1,200 tCO2e/yr, equivalent to 135,000 gallons of gasoline consumed each year[9]

Battery Park City

Target: All buildings' operational emissions will be below Local Law 97 2030 target by 2029

Baseline: 90% of Battery Park City buildings exceed the 2030 limit provisionally set by Local Law 97[10]

Supporting Milestones



Actions

Conduct deep energy retrofits of buildings in Battery Park City	BPCA-led	BPC-wide
• Conduct a full inventory of existing buildings systems (type, installation date, maintenance issues, equipment lifetime, replacement/decommissioning plans) to inform opportunities to achieve economies of scale in retrofit strategies.	✓	
• Provide deep energy retrofit technical guidance and support to buildings (E)	✓	
• Consider elements of indoor environmental quality, occupant health and comfort, waste, and water that can be improved through the process of deep energy retrofits (E)		✓
• Facilitate access to financing, technical support programs, and incentives to achieve cost-effective retrofits (E)	✓	
Educate building operators and building users about energy efficiency opportunities	**BPCA-led**	**BPC-wide**
• Develop educational programs about building retrofits for building owners and operators as well as for residents and tenants (E)	✓	
• Organize energy management training for facilities staff and building operators	✓	
• Publish educational materials such as case studies and toolkits to track and promote retrofit successes in the community (E)	✓	
• Facilitate the adoption of green leases between commercial building owners and tenants		✓
Install Building Energy Information Systems (EIS) to both track and manage energy consumption	**BPCA-led**	**BPC-wide**
• Work with the New York Power Authority (NYPA) to use the NY Energy Manager tool for all BPCA spaces	✓	
• Work with the New York Energy Research and Development Authority (NYSERDA) to increase BPC building participation in the Real Time Energy Management program	✓	
• Connect building owners to programs and partners to install building automation systems and sub-metering to improve consumption monitoring and control capabilities	✓	
• Work with Con Edison to increase participation in Smart Metering and Demand Response programs	✓	
• Work with NYC Retrofit Accelerator to develop capital plans and educational strategies for all BPC buildings	✓	

(E) Items suggested during stakeholder engagement or at BPCA internal pop-ups

Building electrification [E-2]

RM&R I&I

Strategy Description

Transition building heating, hot water, and cooking equipment away from fossil fuel equipment and toward electric equipment to enable GHG reductions

Buildings in Battery Park City rely on natural gas boilers and district steam (serving Brookfield Place and the Goldman Sachs building) for heating, hot water, and cooking, representing 24% of the total energy consumed by BPC buildings. Natural gas is a carbon-based fuel, and any consumption of it results in GHG emissions. Therefore, to achieve carbon neutrality, building heating systems must be converted to electric systems, and the electricity supply must come from carbon-free sources. The transition toward electrification will be considered in alignment with deep energy retrofits and capital planning, and partnerships for technical and financial support will be sought to improve the feasibility of these system replacements. The GHG emissions reduction impact of this strategy is dependent on New York City and State achieving their targets to increase the amount of renewable energy that supplies the electricity grid. As such, electrification must be considered with respect to the broader grid energy supply, emissions and community choice aggregation policies, and energy tariff landscapes. Battery Park City will lead the way in this transition, demonstrating pathways to achieving beneficial electrification in a variety of building scenarios and to increasing the supply of clean electricity on the grid.

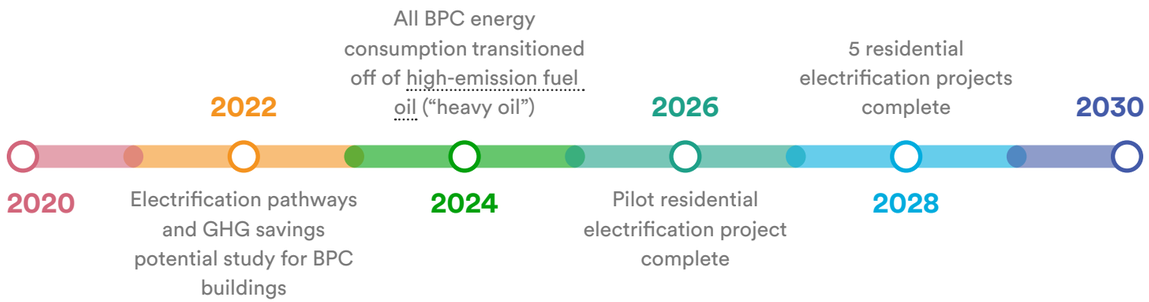
2030 Target

Battery Park City

Target: On-site combustion from fossil fuels capped at 831 million kBtu of energy by 2030

Baseline: On-site combustion from fossil fuels provided approximately 887 million kBtu of energy in 2019[11]

Supporting Milestones

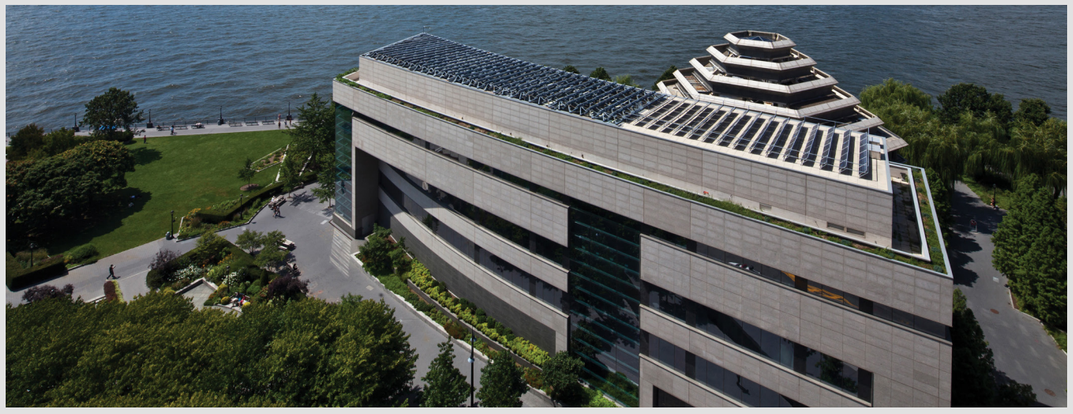


Actions

Assess potential to electrify buildings heating, domestic hot water, and cooking systems during upgrades and renovations	BPCA-led	BPC-wide
• Develop building electrification plans that considers available technologies, existing building typologies, business cases, and battery storage	✓	✓
• Explore opportunities to aggregate electric heating equipment procurement to reduce costs	✓	
• Study and implement building envelope improvements to reduce the heating load to improve the viability of electric heat pump heating systems (E)		✓
• Pilot the full electrification (heating, domestic hot water, and cooking) of a residential or commercial building and share outcomes		✓
Provide information and educational materials about the fossil fuel transition and electrification opportunities	**BPCA-led**	**BPC-wide**
• Review and disseminate information about forthcoming legislation impacting fossil fuel transition	✓	
• Connect building owners and residents to programs and partners to facilitate electrification of systems and appliances (E)	✓	

The Museum of Jewish Heritage is Powered 100% by Electricity

Instead of using natural gas boilers, the Museum of Jewish Heritage has all-electric systems for its heating and hot water, with no on-site combustion of fossil fuels. These systems are powered, in part, by rooftop solar photovoltaics.



Low-carbon district energy systems

[E-3]

RM&R I&I

Strategy Description

Connect building heating and/or cooling systems to a district-scale energy network to realize efficiencies from balancing loads and centralized management

District energy systems, such as the heating and cooling loop serving Brookfield Place, lend themselves to higher efficiency plant operation as compared to individual building equipment—there is an economy of scale as larger equipment tends to be more efficient than the "sum of parts" of smaller pieces of equipment. In addition to being more efficient, they also provide opportunities to introduce low-carbon technologies and fuels, such as biomass, geothermal, and waste heat recovery. District energy has played a central role in global decarbonization efforts, as cities pursue them to reduce their emissions. Provisionally, it is likely that the density of buildings, as well as the variety of building land use and occupancy types, lend themselves to a potential district energy system that could be more efficient, cheaper to operate, and result in lower emissions. While converting to a district energy network is more challenging for existing buildings than for new developments, this opportunity can be explored in line with the planning of deep energy retrofits and building electrification to optimize its impacts.

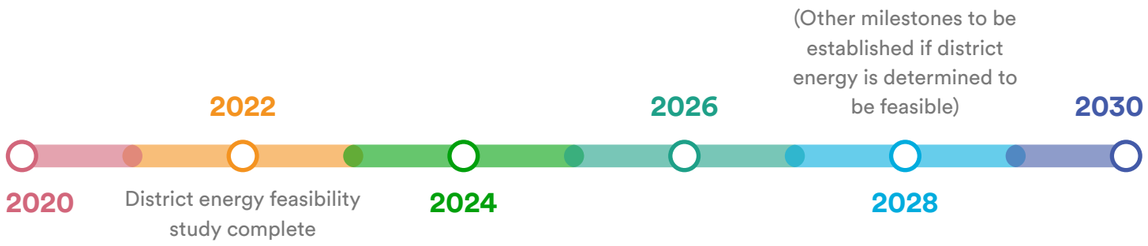
2030 Target

Battery Park City

Target: Based on feasibility, develop a district energy system for part of BPC

Baseline: In 2019, a district energy system serves Brookfield Place

Supporting Milestones

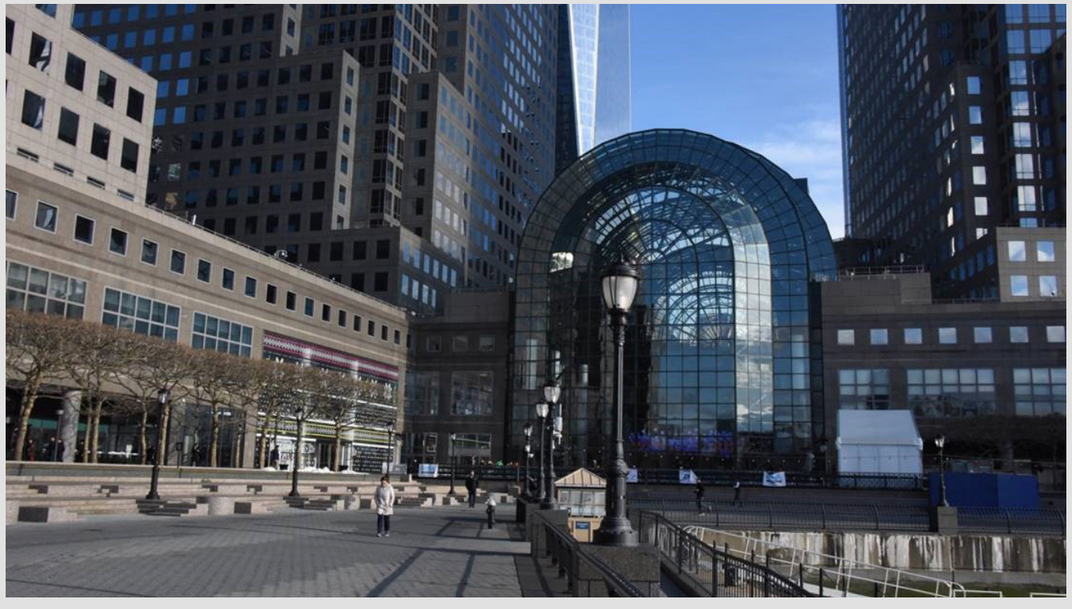


Actions

Evaluate the potential for low-carbon district energy networks across Battery Park City	BPCA-led	BPC-wide
• Conduct a full inventory of existing buildings heating and cooling systems (type, installation date, maintenance issues, equipment lifetime, replacement/decommissioning plans)	✓	
• Study the feasibility of establishing district energy solutions for different areas of Battery Park City and establish recommendations for low-carbon district energy systems	✓	
• Develop a model of Battery Park City building energy profiles to investigate district energy systems in collaboration with NYSERDA	✓	
• Develop a district energy system in Battery Park City based on results of feasibility study	✓	

Brookfield Place District Energy System

Modern district energy systems are low-carbon, and are common for large urban commercial or mixed-use districts and university campuses. In our own backyard, a low-carbon district cooling network is active at Brookfield Place through a partnership with ConEd to reduce energy consumption and be more sustainable. The Brookfield Place central cooling plant utilizes the Hudson River as a heat sink, as opposed to traditional cooling towers, which reduces energy and water demands as well as GHG emissions.



Renewable energy supply and storage

[E-4]

RM&R I&I

Strategy Description

Increase the amount of solar, wind, or other renewable energy generation systems at Battery Park City and procure cleaner electricity to meet the rest of the demand

To achieve carbon neutrality, the energy consumed in Battery Park City must come entirely from sources that do not emit greenhouse gases. Fossil fuel generation must be replaced with a combination of renewable energy and storage at multiple scales, from on-site generation on buildings to large, grid-scale power plants. In addition to reducing climate impact, transitioning to renewable energy can provide lower lifetime energy costs, provide resiliency against energy supply and tariff fluctuations, and support compliance with increasingly-stringent local energy laws. Clean energy technology is improving and costs are decreasing, making this transition increasingly practical and affordable. Because renewable energy is a variable resource, it should be coupled with storage and demand flexibility to further increase our ability to rely on clean supply. Technologies that facilitate this flexibility, such as thermal energy and battery storage, as well as automated demand response controls will be explored as a part of this strategy. Through a combination of on- and off-site renewable generation and storage connected to the neighborhood, as well as through the purchase of renewable energy from third parties, all energy consumed in Battery Park City will transition to clean, non-GHG emitting sources.

2030 Target

Battery Park City Authority Spaces

Target: 100% of electricity supplied to BPCA spaces to come from renewable energy sources by 2025

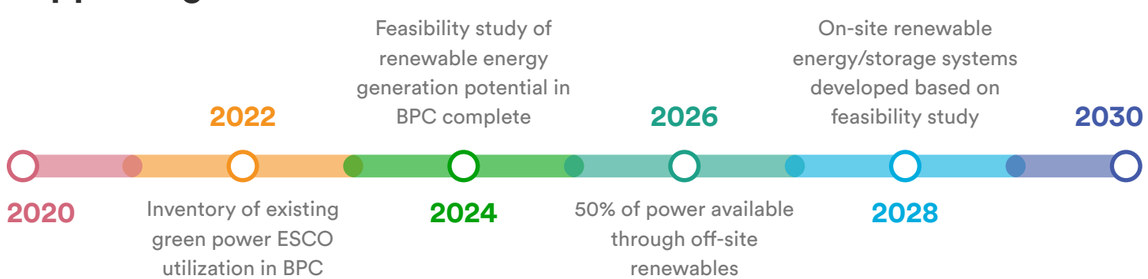
Baseline: BPCA's electricity supply comes from a NYPA natural gas generation plant in Queens

Battery Park City

Target: 70% of BPC electricity to come from renewable energy sources by 2030

Baseline: 14% of BPC electricity came from renewable energy sources in 2019[12]

Supporting Milestones



Actions

Increase renewable energy generation and storage at Battery Park City	BPCA-led	BPC-wide
• Study opportunities to incorporate on-site distributed energy generation such as solar PV, fuel cells, wind turbines, and battery storage (E)	✓	
• Engage Battery Park City in technical and financial support programs to facilitate renewable energy procurement available through government organizations and utilities	✓	
• Engage solar installers to perform assessments of rooftop generation potential for buildings with excess roof space, prioritizing buildings with impending roof upgrades (E)	✓	
• Connect renewable energy developers with Battery Park City customers to facilitate off-site community distributed generation development and off-take	✓	
• Identify additional opportunities to align resiliency actions and parks and open space projects with renewable energy generation in Battery Park City (E)	✓	
Procure 100% renewable electricity for Battery Park City	**BPCA-led**	**BPC-wide**
• Explore Community Choice Aggregation and other models and partnerships to procure 100% renewable electricity for all of Battery Park City (E)	✓	
• Conduct outreach with residents to maximize awareness of clean power purchasing options through ESCOs	✓	
• Work with developers to identify opportunities for off-site community energy for off-take by Battery Park City customers	✓	
Improve the energy resilience and flexibility of Battery Park City by exploring energy storage options	**BPCA-led**	**BPC-wide**
• Identify critical facilities and community spaces, which necessitate special energy backup/resilience	✓	
• Explore the addition of battery storage to provide backup power, as well as revenue generating grid services such as demand response and peak shaving		✓
• Explore opportunities to add battery storage to on-site solar systems and electric vehicle charging stations		✓

GHG emissions monitoring and reporting

[E-5]

RM&R I&I E&C

Strategy Description

Prioritize actions that can reduce GHG emissions and move Battery Park City toward its goal of being carbon neutral by 2050

New York City is targeting an 80% reduction in GHG emissions by 2050 (80×50). In its recent Resilience Action Plan, BPCA committed to the even more ambitious goal of reaching carbon neutrality by 2050 (100×50). The majority of emissions produced in New York City (and Battery Park City) come from building operations; as a result, this is the primary focus of the Energy Strategies introduced in this Plan. Great strides can be made toward carbon neutrality in the next decade, however progress must continue beyond 2030 to ultimately meet this goal. Additionally, emissions from other sectors, like transport and waste, must be considered. An even further step, looking beyond "operational emissions," is to reduce the "embodied carbon" from new construction—the emissions associated with the production, transport, and disposal of materials. Before embarking on this path, Battery Park City must understand what its current GHG emissions footprint is, have a detailed plan for how to reduce it, and continue to track and update these strategies as necessary through 2050.

2030 Target

Battery Park City Authority Spaces

Target: 50% reduction in GHG emissions from 2017 levels by 2030

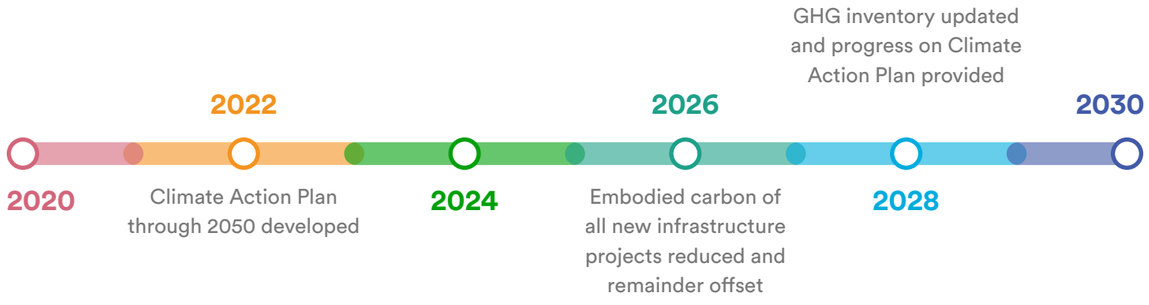
Baseline: BPCA's 2017 GHG emissions totaled 1,870 tCO_2e[13]

Battery Park City

Target: 33% reduction in GHG emissions from 2017 levels by 2030

Baseline: Battery Park City's 2017 emissions totaled 168,900 tCO_2e[14]

Supporting Milestones



Actions

Lead by example in comprehensive decarbonization and carbon sequestration	BPCA-led	BPC-wide
• Develop a Climate Action Plan that builds off of the Sustainability Plan and establishes GHG reduction pathways for buildings, transportation, and waste for 2020–2050	✓	
• Develop a sustainability policy for the BPCA Employee Handbook	✓	
• Quantify the carbon sequestration potential of existing flora and soils	✓	

Lead by example in the construction of new zero carbon buildings and spaces	BPCA-led	BPC-wide
• Work with building owners, developers, and designers to identify strategies and verified offsets to reduce embodied carbon of new construction	✓	
• Disclose one-time offset of embodied carbon for all new construction		✓
• Establish a standard for new building construction, or select from an existing one, such as the Passive House or Net Zero Carbon standards E	✓	

R.M. Fischer's Rector Gate, located at Rector Place along the Esplanade

Water

4

Water at-a-glance

Battery Park City is addressing the changing climate, dealing with water-related issues like sea level rise, storm surge, and the resulting flooding risks associated with them. However, the changing climate also puts water resources at risk to pollutants, as well as puts strain on the availability of these resources due to droughts and rising temperatures. Presently, Battery Park City is provided high-quality water that is plentiful and readily accessible. To protect this resource, we must conserve water and maintain our local water sources for back-up or storage. In this Plan, Water includes indoor and site water consumption, water recycling systems, and stormwater management.

Teardrop Park water play feature

Water Consumption

Potable water is supplied to Battery Park City by the New York City Department of Environmental Protection (DEP). Battery Park City primarily receives water from the Catskill and Delaware watersheds, but with frequent supplement from the Croton watershed.[15] There is a DEP potable water survey sampling location at Pier A in the neighborhood's southernmost end, which provides information on water quality to DEP on a regular basis.

In 2017, buildings in Battery Park City consumed more than 419 million gallons of potable water.[16] Residential multifamily and commercial properties are responsible for the largest share of building water consumption, consuming more than 193 million gallons and 187 million gallons annually, respectively. Data is not currently available for water consumption at civic and institutional properties (schools and museums) in Battery Park City. For parks and landscape care, BPCA uses roughly 37 million gallons of water each year.

As Battery Park City works to become more sustainable, it is critical that potable water demand decrease, reducing the reliance on off-site water resources and improving the resilience of Battery Park City.

456 million gallons of water are consumed every year (excluding schools and museums)

Water Recycling

A number of buildings in Battery Park City also employ water reuse systems to reduce potable water consumption and develop local water resources. These buildings use water treatment systems to reuse wastewater for non-potable applications such as toilet flushing, cooling tower makeup, and irrigation.[X1] There are currently five building water reuse systems in Battery Park City that serve six residential multifamily buildings: Millennium Tower, Riverhouse, The Solaire, The Verdesian, The Visionaire, and Tribeca Green.

The Solaire was the first building in New York City to provide on-site wastewater treatment. A precast concrete storage tank under Teardrop Park holds greywater recycled from the adjacent Solaire, providing water for irrigation and the Ice Wall water feature at the north of the park. Two storage tanks located adjacent to Teardrop Park South, in the basement of the Riverhouse parking garage, supply water for two outdoor water features within the park. When stored water levels are low, these systems are supplied by municipal potable water.

Site Permeability

Approximately 38% of parks and public open space within Battery Park City are permeable and allow for stormwater infiltration, while the remaining 62% is impermeable, consisting primarily of plazas, walkways, and other paved surfaces. The primary method to better control stormwater runoff is to capture it for other uses or detain it on-site for slow release onto grassy areas, or other permeable surfaces. Permeable surfaces allow for stormwater to infiltrate into the ground rather than collecting on the surface leading to flooding concerns.

62%
of parks and open spaces in Battery Park City are impermeable

6
buildings have water recycling systems

11
buildings have green roofs

Resiliency and Stormwater Management

The ongoing BPC Resiliency Projects (North, West, South, and Ball Fields & Community Center) will provide flood risk reduction to the neighborhood, and are primarily focused on the threats of flooding from storm surges and sea level rise. However, inland stormwater drainage measures are being incorporated into all resiliency projects to address flooding concerns.

Approximately 112 million gallons of precipitation falls each year in Battery Park City, peaking in June with six inches of rain on average (12% of the annual total). To handle the resulting stormwater runoff, Battery Park City is served by a combination of stormwater infrastructure systems. Covering the area south of Liberty Street to the northern edge of Wagner Park, Battery Park City is served by a separated stormwater system, called a municipal separate storm sewer system (MS4), that collects and conveys stormwater runoff through a dedicated, and separate, network of pipes and directs runoff to the Hudson River. The rest of Battery Park City is served by combined sewer systems that mix stormwater runoff with sanitary sewage collected from buildings. The inundation of a combined sewer system can lead to combined sewer overflows, or CSOs, which release this water mixture into the Hudson River and can pollute local waters.

Heavy storms can overwhelm the stormwater infrastructure and exacerbate combined sewer overflows leading to increased water quality issues and a need for better stormwater management systems. Stormwater management principles include managing and directing runoff, maintaining water quality of stormwater runoff, and expanding green infrastructure like bioswales and rain gardens. Some stormwater runoff is captured by on-site detention tanks in Battery Park City, and eleven buildings have green roofs that work to reduce flow, capture stormwater, and minimize the impact on the rest of the site.

Water Highlights

- Green roofs
- Water recycling systems
- 1 Recycled water used for park features

Water Strategies

Strategy 1: Water conservation

Strategy 2: Water recycling systems

Strategy 3: Resiliency and stormwater management

Water conservation [W-1]

RM&R I&I E&C

Strategy Description

Reduce the amount of water that is consumed in Battery Park City through more efficient equipment and education aimed at behavior change

New York City is fortunate to have high quality water that must be protected as the future of water resources is uncertain, due to a changing climate. While increased overall precipitation is expected, extreme heat and periods of drought will also increase in the near future, putting our water resources at risk. To reduce the demand for potable water and to improve the resilience of the area, measures will be enacted to significantly improve water conservation in buildings and park spaces across Battery Park City. A simple way to conserve water is to target water consumed during daily activities, through improvements like using water-efficient equipment and appliances to installing low flow fixtures on all faucets, and using drip irrigation. Other water conservation measures rely heavily on education and outreach to change behaviors, such as reducing the length of showers, minimizing the washing of sidewalks with potable water, or identifying and fixing leaks right away. Additionally, a rollout of sensors on water infrastructure can enable monitoring and control of water consumption and leaks, as well as increase awareness of water consumption in Battery Park City.

2030 Target

Battery Park City Authority Spaces

Target: Reduce the amount of potable water consumed by BPCA spaces by 20% by 2030

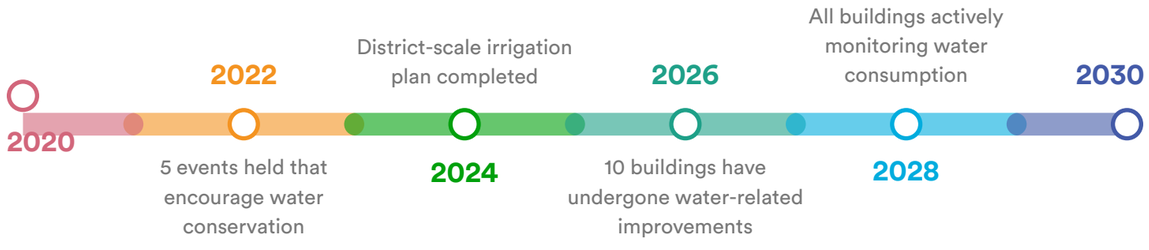
Baseline: 47 million gallons of water used by BPCA spaces in 2019[17]

Battery Park City

Target: Reduce the water use intensity for residential and commercial buildings 10% by 2030

Baseline: Median multifamily water use intensity in BPC was 41.7 gal/SF/yr in 2017; Median commercial water use intensity in BPC was 40.8 gal/SF/yr in 2017[18]

Supporting Milestones



Actions

Improve the monitoring and management of water consumption	BPCA-led	BPC-wide
• Install smart water meters in all buildings		✓
• Install smart sub-meters for all residential units and commercial tenants, as appropriate, to improve monitoring and consumption transparency (E)		✓
• Establish and implement a district-wide smart irrigation plan	✓	
Minimize potable water losses through sprinkler irrigation or leaks	BPCA-led	BPC-wide
• Install leak detection equipment for irrigation systems across Battery Park City (E)	✓	
• Expand drip irrigation from flower beds to the majority of landscaped areas, including lawns	✓	
Encourage water conservation in buildings	BPCA-led	BPC-wide
• Conduct water audits of buildings to document efficiency of appliances, fixtures, and HVAC systems and provide recommendations for improvements		✓
• Install low flow fixtures and water-efficient appliances		✓
• At the time of building upgrades or renovations, install water-efficient HVAC systems (E)		✓
Educate the community on water conservation practices through a behavior change campaign	BPCA-led	BPC-wide
• Educate the community on water conservation and sustainable choices through a behavior campaign with informational materials and events	✓	

Smart Drip Irrigation

Smart drip irrigation is used throughout most of Battery Park City in planting beds, allowing water to infiltrate directly to the plant roots without evaporation.

(E) Items suggested during stakeholder engagement or at BPCA internal pop-ups

Water recycling systems [W-2]

RM&R I&I

Strategy Description

Install systems that treat wastewater from sinks and showers or stormwater for reuse in toilets, cooling towers, irrigation, and other uses at Battery Park City

Battery Park City is home to five building-scale water recycling systems that serve six residential buildings, as well as a recycling system for irrigation, use in water features, and other park needs. Water recycling systems take wastewater from bathrooms, kitchens, laundry equipment, and other process loads and filter and treat the water to proper levels for reuse in toilets, cooling systems, irrigation or other non-potable demands. Water recycling systems can also be designed to treat water to potable demand standards in order to meet potable needs. There is an opportunity to connect some of the water recycling systems at Battery Park City into a site-wide network that can integrate storage and promote expanded water reuse. Ultimately, Battery Park City will expand water recycling systems including rainwater, greywater, and blackwater systems to meet all non-potable demands of buildings, parks, and site.

2030 Target

Battery Park City Authority Spaces

Target: 15% of non-potable water demand for parks and landscape care provided by recycled water by 2030

Baseline: Of parks and landscape care at BPC, only Teardrop Park utilized recycled water in 2019[19]

Battery Park City

Target: 29% of built area at BPC served by a water recycling system by 2030

Baseline: 11% of built area at BPC served by a water recycling system in 2019[20]

Supporting Milestones

2020

2022
5 buildings have calculated and understand their non-potable water demand

2024
1 pilot project completed to utilize recycled water in cooling towers

2026
Blackwater treatment and reuse study completed

2028
3 buildings have cooling towers that utilize recycled water

2030

Actions

Maximize greywater reuse for all non-potable demands at Battery Park City	BPCA-led	BPC-wide
• Determine non-potable water demand for each building		✓
• Explore water recycling systems for use in cooling towers (E)		✓
• Utilize treated water or captured stormwater for washing site pavement/walkways and for irrigation needs (E)	✓	✓
• Consider a Battery Park City "purple pipe network" for shared water treatment and reuse resources (E)	✓	

Expand blackwater treatment and reuse systems	BPCA-led	BPC-wide
• Study the potential for blackwater treatment and reuse systems	✓	

Teardrop Park Water Reuse System

Teardrop Park has two primary water features—a "water wall" feature and a bubbling water/fountain feature. The former uses recycled water as it is not intended for play, while the later uses timers for potable water use and a child-controlled start button, significantly limiting its water use.

Resiliency and stormwater management

[W-3]

RM&R E&C

Strategy Description

Improve resiliency to protect against major storms, upgrade stormwater infrastructure, and increase the amount of permeable surfaces in Battery Park City

Resiliency and stormwater management at Battery Park City are growing concerns as precipitation patterns are changing and major storm events are becoming stronger and more frequent. Battery Park City is actively working to build local resilience and protect people and infrastructure from major incidents by studying, designing, and implementing projects on coastal and storm resiliency through the BPC Resiliency Projects. In addition to the threats from storm surges and sea level rise, precipitation volumes are increasing and, consequently, the amount of stormwater that must be managed at Battery Park City is increasing. Stormwater management best practices include maximizing permeable surfaces and detaining and treating stormwater with green or grey infrastructure (typical systems, usually made of concrete). Nearly 62% of Battery Park City's parks and public open spaces are impermeable, consisting of plazas, walkways, and other paved surfaces. Permeable spaces like gardens, parks, and natural areas allow rainwater to filter through the ground, rather than pooling on the surface. Increasing the amount of permeable surface area in Battery Park City will help to mitigate the amount of rainwater that must be otherwise managed. While some stormwater runoff is currently captured through on-site detention tanks or green roofs on buildings, most ends up as runoff into the Hudson River and sometimes contributes to combined sewer overflows that pollute our waterways. With increased permeability and green stormwater infrastructure, Battery Park City can improve stormwater management and reduce the potential for localized flooding.

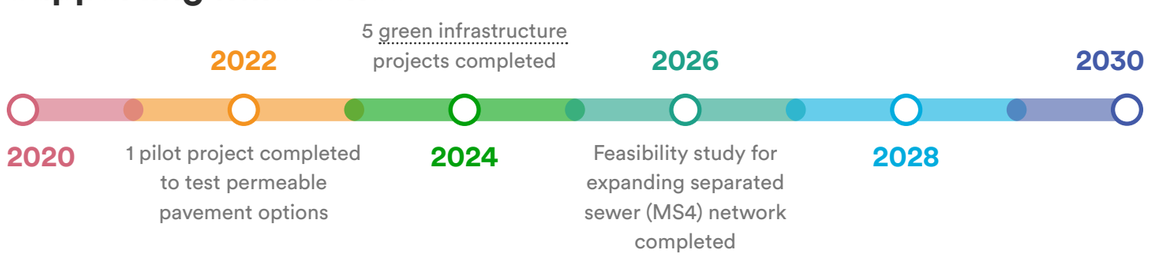
2030 Target

Battery Park City Authority Spaces

Target: All BPC Resiliency Projects completed and 46% of Battery Park City's parks and public open spaces to be permeable by 2030

Baseline: 38% of Battery Park City's parks and public open spaces were permeable in 2019[21]

Supporting Milestones



Actions

Work to make Battery Park City more resilient to major storms	BPCA-led	BPC-wide
• Complete planned BPC Resiliency Projects (North, West, South, Ball Fields & Community Center) E	✓	
• Adapt BPC buildings to prepare for major storms and increased flooding		✓

Increase the permeability of Battery Park City through pavement modifications and green stormwater infrastructure	BPCA-led	BPC-wide
• Explore opportunities to convert hardscape to softscape	✓	
• Conduct a pilot project to test out different permeable pavement options	✓	
• Install permeable pavements in areas most impacted by rain events E	✓	
• Identify locations for bioswales, green roofs, and rain gardens in Battery Park City and implement projects as upgrades are made to structures, streets, or parks E	✓	

Improve stormwater infrastructure to limit combined sewer overflow incidents	BPCA-led	BPC-wide
• Identify and implement opportunities for additional stormwater detention and storage to improve stormwater management and enable water recycling systems	✓	
• Partner with DEP to study the feasibility of expanding separated sewer (MS4) network to areas north of Liberty Street	✓	

South Cove Jetty

Materials and Waste

5

Materials and Waste at-a-glance

Materials and waste have a significant impact on the urban environment as well as the GHG emissions of Battery Park City. The materials we bring into Battery Park City affect the amount of waste that needs to be managed and properly disposed. Wise consumption choices from the outset paired with robust reuse programs can minimize the amount of waste produced in Battery Park City while recycling and composting programs can further reduce the amount of waste sent to landfills. Organic waste that ends up in landfills breaks down and emits methane, a potent GHG, which exacerbates climate change and increases our carbon footprint. In this Plan, Materials and Waste includes materials consumption and procurement, waste disposal, organics collection, and waste management.

BPCA 75 Battery Place facility

Materials and Consumption

The purchasing and procurement of materials that come into Battery Park City is the first opportunity to be more sustainable and reduce waste. At BPCA, programming events are supplied with boxed water as opposed to bottled water and all new staff members are given a "Zero-Waste Success Kit," which includes metal silverware, a metal straw with a cleaner, a metal thermos, and a metal water bottle. Practices such as these can reduce the amount of waste generated and contribute to a more sustainable community. Promoting sustainable behaviors in the BPC community, like reducing single-use materials, and changing our behaviors around consumption will help reduce the amount of waste that ends up in landfills. Products and materials can also impact the indoor air quality of our spaces, affecting our health and wellness, and should be carefully selected.

Waste Generation

The amount of waste any person or building generates in a certain period of time is hard to quantify with contemporary waste management systems and can be inconsistent in any case. Even harder to quantify is how much of the waste generated could have been recycled rather than sent to a landfill.

At Battery Park City, waste is not weighed or otherwise measured to determine how much each building is generating and how much of that could be properly recycled or composted. To estimate a waste generation total, assumptions are made for how much waste—of several different types—is created by office employees, residents, and retail employees on a daily or weekly basis. These "waste generation rates" are then extrapolated to the Battery Park City community at-large. From this assessment, buildings in Battery Park City produce an estimated 46.2 million pounds of solid waste each year, a majority of which is generated by commercial office and residential multifamily properties.[22]

Waste audits are a method that can be used to better understand how much waste a building or space generates, and how much of it is disposed properly (and diverted from landfill). Waste audits require the manual weighing and sorting of waste to determine its weight and composition. BPCA's Zero Waste Advisory Committee recently began conducting waste audits of its 75 Battery Place facility in an effort to reduce waste generation and achieve a Zero Waste certification from TRUE. Based on the waste audits conducted throughout 2019, the 75 Battery Place facility diverts 90.09% of waste generated by staff from landfills.[23]

15% of waste is estimated to be recycled or composted across Battery Park City

while 90% is diverted from landfills at the BPCA 75 Battery Place facility

Waste Disposal

There are four primary streams for waste: reuse, compost, recycle, and landfill. Recycling, reuse, and composting programs exist in Battery Park City and aid in reducing the amount of waste sent to landfills. Of the waste generated in Battery Park City, an estimated 15% is currently diverted from landfills.[24]

Roughly 14.8 million pounds of waste generated in Battery Park City, or 32% of the total waste generated, is estimated to be organic waste that could be composted while 22.5 million pounds of waste, or 49% of all waste, is made up of plastic, glass, metal, or paper materials that should be recycled. If all waste generated was properly disposed of, Battery Park City could divert 82% of waste from landfills[25] with new and expanded recycling, composting, and reuse programs. With the OneNYC plan, New York City committed to sending zero waste to landfills by 2030. Working alongside the rest of NYC, Battery Park City can achieve higher diversion rates and strive for zero waste.

Waste Management

For a majority of residential buildings, landfill waste is carted to one of two compactor stations managed by BPCA. Separately, waste for the buildings at Gateway Plaza is sent to a centralized on-site compactor. An estimated 8.5 million pounds of waste is handled by these compactors each year.[26] The compacted waste is picked up by the New York City Department of Sanitation (DSNY) three times per week. The compactor system reduces curbside trash and the number of DSNY pickups while helping control vermin in the area without the use of harmful chemicals. While residential landfill waste is collected at these three locations, residential recycling is picked up curbside by DSNY throughout Battery Park City. All commercial waste is handled by private haulers that operate on independent schedules with their own trucks and equipment.

BPCA operates a robust composting program that currently accepts raw fruits and vegetables, coffee grounds, tea bags, napkins, unbleached paper towels, and plant materials. However, BPCA is investigating expanding the program to include dairy, meat, fish products, and other materials. By expanding the types of organic materials that can be collected at Battery Park City, any excess organics that cannot be processed on-site could be picked up as part of larger citywide composting programs.

Organic waste is collected at drop-off locations available at 75 Battery Place and at the Esplanade, by Chambers Street and River Terrace. Gateway Plaza has building-scale compost collection where residents are encouraged to deposit organic waste in bins throughout the complex. Collected organic material from Battery Park City is then composted using a BPCA-operated composter. In 2019, 62,966 pounds of organic waste from the neighborhood was composted at Battery Park City, up from 55,462 pounds the prior year.[27] The resulting compost is used directly in Battery Park City parks and gardens.

Additionally, a recently initiated pilot project collects dog waste for composting from the neighborhood's three dog runs. In the first ten months of the program, over 1,000 pounds of dog waste have been collected.[28] The dog waste is composted separately from other organic waste and mixed with sawdust and coffee grounds from a BPCA in-house carpentry shop and a local coffee shop, respectively.

46.2
million pounds
of solid waste is generated at Battery Park City each year

62,966
pounds
of organic waste was composted at Battery Park City in 2019

1,000
pounds
of dog waste have been collected for composting between April 2019 and April 2020

Materials and Waste Highlights

- Compost drop-off locations
- Compactor stations
- 1 Composting collection at Gateway Plaza, part of BPCA's composting operation
- 2 BPCA's 75 Battery Place facility is Zero Waste Certified

Materials and Waste Strategies

Strategy 1: Sustainable consumption

Strategy 2: Sustainable building materials

Strategy 3: Waste diversion

Strategy 4: Organics collection and composting

Strategy 5: Construction and demolition activities

Sustainable consumption [M&W-1]

RM&R E&C

Strategy Description

Alter consumption patterns and reduce single-use materials and other wasteful items by encouraging reuse and donations

By reducing the amount of materials purchased, delivered, and consumed in Battery Park City, the amount of waste that must be managed can be significantly reduced. It is no small feat to change people's consumption habits, but behavior change can be initiated by promoting sustainable daily practices like using reusable water bottles or dish towels rather than paper towels. Relatedly, eliminating single-use plastics that dominate retail, and the cardboard boxes that pile up on streets from online deliveries, will significantly reduce the amount of waste disposed of each day. Reducing the consumption of goods and materials will require the participation of everyone who lives in, works in, and visits Battery Park City—as well as those service providers and consultants who conduct business in the area. Moving forward, these groups should be zero waste or circular economy vendors that have sustainability priorities that align with Battery Park City's goals. Battery Park City will use less and buy smart, guided by educational materials and events that showcase sustainable alternatives and best practices.

2030 Target

Battery Park City

Target: Achieve behavior change that supports waste reduction, recycling, and reuse in Battery Park City by 2030

Baseline: In 2019, BPCA was a leader in sustainable material consumption by avoiding single-use plastics and transitioning to reusable products

Supporting Milestones

2020 — BPCA Procurement and Permitting Guidelines updated to include sustainable materials and waste guidance

2022 — 15 water bottle refill stations installed across Battery Park City

2024 — 5 restaurants and retail spaces in BPC have committed to ban single-use plastics

2026 — 50 zero waste events held at Battery Park City, hosted or permitted by BPCA

2028

2030

Actions

	BPCA-led	BPC-wide
Limit the amount of materials that enter and the amount of waste that exits Battery Park City, through procurement and permitting		
• Ensure that BPCA Procurement Guidelines contain sustainability guidance and provide direction on the consumption and tracking of materials that enter and exit Battery Park City (E)	✓	
• Ensure that the BPCA permitting processes set sustainability goals and ensure limits on the materials that come in and go out of Battery Park City (E)	✓	
• Procure zero waste or circular economy vendors for catering and other services (E)		✓
Reduce the use of single-use materials through infrastructure and programming		
• Eliminate single-use plastics and other wasteful materials across Battery Park City restaurants and retail spaces		✓
• Expand the availability of water bottle refill stations that encourage the use of reusable water bottles (E)	✓	
Educate the community on consumption patterns and alternatives to reduce waste generation		
• Host educational events to showcase sustainable behaviors and products for the home and workplace	✓	
• Develop a guide for residents on sustainable materials and consumer goods to educate them while shopping including guidance on eco-labels, sustainable wood products, etc.	✓	
• Develop a program to promote Battery Park City businesses to encourage local shopping	✓	

(E) Items suggested during stakeholder engagement or at BPCA internal pop-ups

Sustainable building materials

[M&W-2]

RM&R I&I

Strategy Description

Promote the reuse and recycling of building materials and the selection of materials that enhance indoor air quality

Required maintenance and upkeep projects, major retrofits, and new construction have an impact on the environment, but there is an opportunity for Battery Park City to mitigate this. Improving material selections and optimizing their use can significantly reduce a construction or renovation project's impact on the environment and people's health. Selecting materials with less carbon-intensive supply chain (including extraction and manufacturing processes), and reusing existing building components, can go a long way toward reducing GHG emissions of a project. Additionally, proper design can reduce a project's environmental impact by designing for dematerialization or for disassembly, to facilitate end-of-life recycling or reuse. Building material choices have impacts beyond GHG emissions, as people spend the vast majority of their time indoors and materials, such as carpets or paints, can have a significant influence on the quality of the indoor environment, which directly affects air quality and our overall health. Battery Park City will look to support sustainable design processes and to procure low-impact building materials that will contribute to superior indoor air quality and occupant health and wellness.

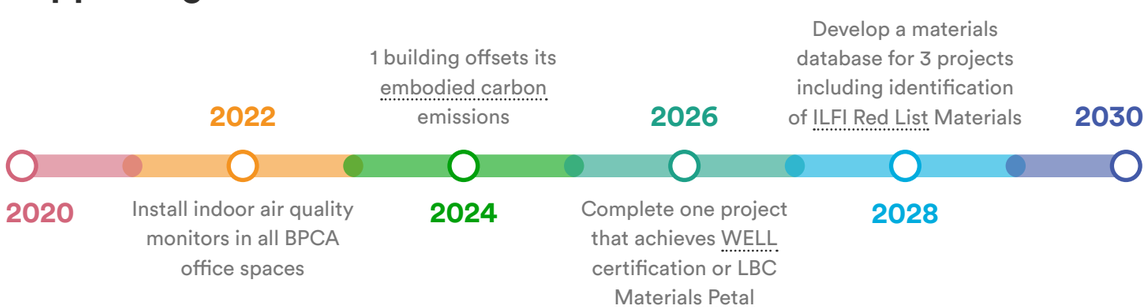
2030 Target

Battery Park City

Target: 25% of construction or renovation project materials, by weight, to be from the ILFI Declare database, Cradle to Cradle certified, or other comparable sustainable materials by 2030

Baseline: Sustainable building material use not tracked

Supporting Milestones



Actions

Improve indoor health and wellness through material selection	BPCA-led	BPC-wide
• Avoid volatile organic compounds (VOCs) and VOC-emitting materials or equipment in homes and commercial spaces	✓	✓
• Reference the ILFI Red List during fit-outs, renovations, or construction projects to avoid harmful materials	✓	✓
• Consider the installation of indoor air quality monitors throughout Battery Park City	✓	✓
Support the reduction of embodied carbon in buildings and materials	**BPCA-led**	**BPC-wide**
• Develop material databases for buildings that identify the embodied carbon associated with the materials in a building that can be updated and used for assessment during renovations	✓	
• During major renovation or construction projects, collaborate with BPCA and other partners to identify sources of reusable materials in Battery Park City or beyond	✓	✓

Pier A Harbor House renovations

Waste diversion

[M&W-3]

RM&R E&C

Strategy Description

Increase the amount of reused and recycled materials, and separately dispose of organic waste, to reduce the amount of waste sent to landfill and the associated GHG emissions

Across Battery Park City, there are initiatives to reduce the amount of waste sent to landfills. Programs include drop-off locations for organic waste, on-site composting, and reuse and recycling programs. In Battery Park City, it is estimated that 85% of all waste generated is currently sent to landfill, while—based on the composition of the neighborhood's waste—there is potential to send only 18% to landfill. Central to achieving this goal is to promote reuse with centralized locations for donations and material reuse that act as educational opportunities for people to learn how to properly dispose of items. Targeted events that promote the reuse and donation of certain items can activate Battery Park City to engage with the programs. By emulating BPCA's efforts to be a Zero Waste organization, awareness and education of waste issues and opportunities will be stimulated across the neighborhood.

2030 Target

Battery Park City Authority Spaces

Target: Zero waste sent to landfills from BPCA-managed spaces by 2030

Baseline: 90% of 75 Battery Place waste was diverted from landfills in 2019[29]

Battery Park City

Target: 50% reduction in landfill waste sent to compactors by 2030

Baseline: 8.5 million pounds of residential landfill waste compacted in 2019[30]

Supporting Milestones

Actions

	BPCA-led	BPC-wide
Support the development of reuse centers and educational programs across Battery Park City to influence behavior change		
• Host events for people to bring atypical waste and learn about options for reuse, donation, or recycling (E)	✓	
• Host reuse events like a costume swap, a drop a bag, take a bag event, or fix it events where broken items can be brought in for repair rather than being thrown away (E)	✓	
• Donate unused food from food retailers and restaurants		✓
Expand recycling and composting activities through additional infrastructure, education, and training		
• Develop consistent signage for waste, recycling, and organics collection across Battery Park City (E)	✓	
• Pilot recycling bins in parks to assess the impact on waste diversion (E)	✓	
• Develop an education program to raise awareness about available recycling and composting programs and how community members can contribute	✓	
• Train at least one building management staff member for each building to achieve the NYC Zero Waste Building Maintenance Training Certificate, or similar (E)		✓
• Enroll in optional recycling programs such as e-waste recycling and clothing donations (E)		✓
• Identify creative ways to reduce the amount of waste sent to landfill by BPCA Parks Operations and Parks Programming events (E)	✓	
Conduct waste audits and collect waste data to better understand diversion and track progress	BPCA-led	BPC-wide
• Conduct regular audits of residential waste sent to compactors and public trash cans throughout the neighborhood, and report findings to residents and building owners (E)	✓	
• Pilot weighing all building waste brought to BPCA compactors on a regular basis (E)	✓	
• Conduct regular waste audits of commercial properties and tenant spaces (E)		✓
• Send waste in clear bags to compactors to allow for a visual check for contamination		✓

Art Programs Reuse Materials

Parks Programming regularly reuses and repurposes materials such as plant clippings from the parks and discarded newspapers, scrap paper, and boxes from deliveries for art programs. BPCA programs and event guides are also printed on 100% recycled chlorine-free paper with soy and vegetable ink, and leftovers are recycled to create seed paper.

Organics collection and composting

[M&W-4]

RM&R E&C

Strategy Description

Expand organic waste collection and composting programs in Battery Park City with a wider network of collection bins and composting education

BPCA currently operates a successful composting program utilizing organic waste from community drop-off bins, local coffee shops and restaurants, and plant waste. The compost produced in Battery Park City is used in neighborhood parks and gardens. As the neighborhood makes efforts to minimize the amount of waste sent to landfills, properly managing organic waste is a priority. When disposed of in landfills, organic waste decomposes and releases methane, a powerful GHG. To reduce these emissions, BPCA will expand the composting program by activating all Battery Park City buildings to create a wider organics collection network and increased education and outreach. Currently, BPCA collects only raw fruits and vegetables, plant waste, and coffee grounds for composting. BPCA will dedicate itself to grow the program to accept all organic waste materials for a clear and simple program that can connect with the broader New York City-wide composting program.

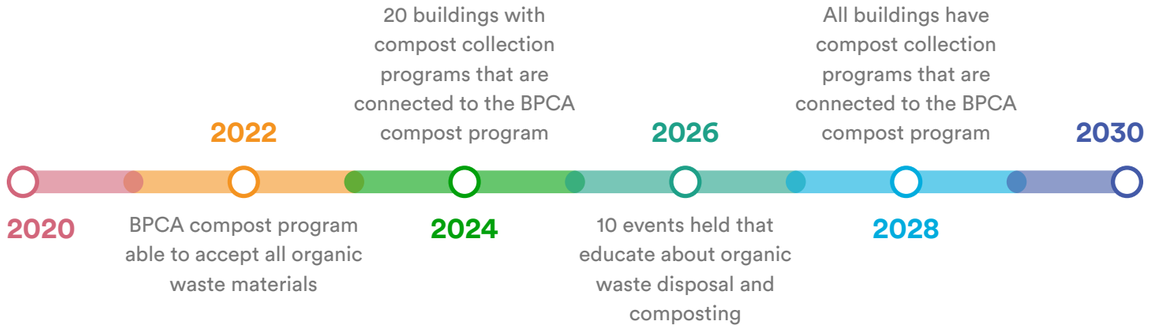
2030 Target

Battery Park City

Target: 80% of Battery Park City organic waste to be diverted from landfills in 2030

Baseline: An estimated 1% of Battery Park City organic waste was diverted from landfills in 2019[31]

Supporting Milestones



Actions

Expand and improve the Battery Park City organic waste collection network	BPCA-led	BPC-wide
• Educate the community on composting practices and organic waste emissions through events and informational materials, partnering with DSNY and waste education non-profits	✓	
• Collaborate with Battery Park City's Liberty Community Garden to expand composting outreach and learning opportunities for the community (E)	✓	
• Provide space in buildings for organic waste collection and educate occupants about the program (E)		✓
• Encourage composting programs in neighborhood schools to educate Battery Park City's younger population (E)	✓	
Increase local capacity for composting and broaden the organic waste types that can be composted at Battery Park City	**BPCA-led**	**BPC-wide**
• Replace composting equipment and expand capacity to accept all organic waste materials and to meet all of Battery Park City's compost needs	✓	
• Partner with DSNY and other organizations to collect organic waste that cannot be composted on-site to maximize organic waste collection at Battery Park City	✓	

BPCA Compost Program

BPCA operates a composter on-site to process organic waste collected throughout the neighborhood. The current compost program accepts raw fruits and vegetables, plant waste, and coffee grounds, and the resulting compost is used in landscaped areas to return nutrients to the soil.

Construction and demolition activities

[M&W-5]

RM&R I&I

Strategy Description

Reduce the impact of construction and demolition related activities in the neighborhood and recycle or reuse construction and demolition waste

The next ten years will be a period of major construction in Battery Park City with numerous building renovations and upgrades as well as significant ongoing resiliency projects. The increase of building renovation projects will be spurred by the need to meet city-wide emissions targets but will also enable wider sustainability improvements. With a focus on materials and waste at Battery Park City, it is critical that each of these projects consider the impact of its waste. Construction and demolition (C&D) activities can produce large amounts of waste in a short amount of time. Luckily, the majority, if not all, of the waste generated by these activities can be reused or recycled. BPCA will develop guidance to support the sustainability of these activities and require that C&D waste be reused or recycled.

2030 Target

Battery Park City

Target: 95% of construction and demolition waste recycled or reused by 2030

Baseline: Construction and demolition waste not tracked

Supporting Milestones

2020 — BPC construction activity guidance developed and shared

2022

2024 — One construction, demolition, or renovation project completed with zero C&D waste

2026

2028

2030

Actions

Develop more sustainable construction practices at Battery Park City and increase the amount of C&D waste recycled or reused	BPCA-led	BPC-wide
• Establish construction guidance with requirements for C&D recycling and reporting	✓	
• At the time of major renovation or construction, develop a plan for managing C&D waste and reusing materials as applicable	✓	✓
• At the time of major renovation or construction, post signage explaining sustainability elements of the project	✓	✓
• Minimize C&D waste resulting from the construction of resiliency projects	✓	
Mitigate the impacts of construction and renovations by sequencing and coordinating activities and sharing materials	**BPCA-led**	**BPC-wide**
• Work with BPCA in the development of construction plans and schedules to identify potential coordination with other projects		✓
• Where possible, work alongside other ongoing local projects to identify material reuse opportunities, or other opportunities such as equipment sharing, during construction		✓

Construction at Pier A Plaza

Site

6

Site at-a-glance

For many, the Battery Park City experience is defined by interactions in the public realm—in the streets and sidewalks, the parks, the Esplanade, and other open spaces. Sustainability in the neighborhood must extend to these spaces, in addition to encompassing energy, water, and materials and waste. In this Plan, Site refers to topics of broader environmental quality in Battery Park City, covering transportation/mobility, environmental health, and ecosystems and resiliency.

Battery Park City Ball Fields

Habitats and Ecosystems

The quality of the parks and open spaces in Battery Park City can be greatly attributed to the detailed horticultural management and maintenance procedures conducted by the BPCA Parks Operations Department. Parks and open space are maintained organically, with careful plant selection, and regular soil testing to ensure healthy biological activity. Parks Operations uses non-toxic measures for pest and disease control for plants, such as the introduction of beneficial insects and nematodes. The parks and open spaces are biodiverse, with over 2,000 species of plantings.[32]

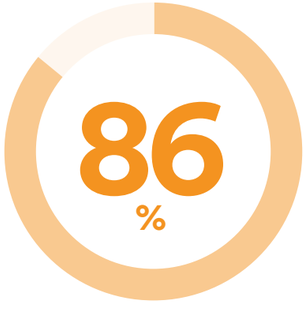
These careful management procedures allow for great biodiversity at Battery Park City, and with this, resiliency to different weather conditions, storm events, and climate change. Better ecosystem health for the flora and fauna results in better environmental health, a key component of the 2019 Resilience Action Plan—establishing Battery Park City as a biodiversity haven. Further enhancements to ecological health will serve not just the plants and animals that call Battery Park City home, but also the people living in, working in, and visiting it.

Resiliency

The ongoing BPC Resiliency Projects will incorporate both constructed systems (fixed and deployable barriers) and green stormwater infrastructure (increased softscape and other permeable natural areas, and landscape modifications). The combination of these two types of interventions will protect property and residents from damages like those seen during Superstorm Sandy, but additionally, they will also benefit landscape elements that can be damaged or poisoned from brackish water inundation.

- The South BPC Resiliency Project originates at the intersection of First Place and the Esplanade and reaches along the water side of the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and along the north side of The Battery to a point between Greenwich Street and State Street.
- The West BPC Resiliency Project extends roughly from the western endpoint of the North BPC Resiliency Project, approximately located at the intersection of Chambers Street and River Terrace, south along the BPC waterfront to the western endpoint of the South BPC Project, approximately located at the intersection of the Esplanade and 1st Place.
- The BPC Ball Fields & Community Center Resiliency Project provides an independent interim flood barrier system along the eastern, northern, and southern boundaries of the BPC Ball Fields to remain in place until the North and South BPC Resiliency Projects are completed.
- The preliminary alignment for the North BPC Resiliency Project begins just west of Stuyvesant High School and extends eastward along the BPC North Esplanade, turning north and crossing Route 9A at Harrison Street and ultimately extending east along North Moore Street to Greenwich Street.

In addition to protecting the neighborhood from flooding, there are other ways to improve Battery Park City's resiliency. A key component of urban resiliency is addressing the urban heat island (UHI) effect, which can be mitigated by site improvements such as landscaping strategies, site pavement types, and the installation of shading structures. These interventions not only enhance resiliency, but also improve Battery Park City's quality of life.



of residents commute via public transit or active transportation

5,000 miles/year logged by BPCA electric vehicles

2,000 species of plantings in Battery Park City parks and open spaces

36 acres of parks and open spaces

3 miles of streets

Transportation/Mobility

Of the Battery Park City residents that commute, approximately 86% use public transportation or active transportation (walking/biking/other), and 14% drive alone or carpool.[33] Battery Park City is primarily served by the M20 bus and the Downtown Connection, a free shuttle bus operated by the Downtown Alliance and partially funded by BPCA, which runs along Lower Manhattan's perimeter.

The 2019 Resilience Action Plan calls upon BPCA to make the streetscape and public spaces accessible and enjoyable to a wide range of users. There are just under three miles of streets in Battery Park City. Generally, both one-way and two-way streets have free parking on both sides, and in some locations there are shared or dedicated bicycle lanes. According to data tracked by NYPD, motor vehicle crashes within Battery Park City resulted in one pedestrian death and one motorist death between 2012 and 2018, however over the same period there were 18 pedestrian injuries, 23 bicyclist injuries, and 53 motorist injuries.[34]

At present, a disproportionate share of the public space in Battery Park City is dedicated to motor vehicles (travel and parking) when compared to the mode share of the community—the percentages of people walking/biking or taking public transit versus the percentage driving. This has safety implications for pedestrians and bicyclists, and discourages an even higher percentage of active or non-motorized transportation.

Air Quality

Since 9/11, air quality has been an issue of utmost importance and attention in Lower Manhattan. With this long and complicated legacy, it stands out as a key issue to address in this Sustainability Plan.

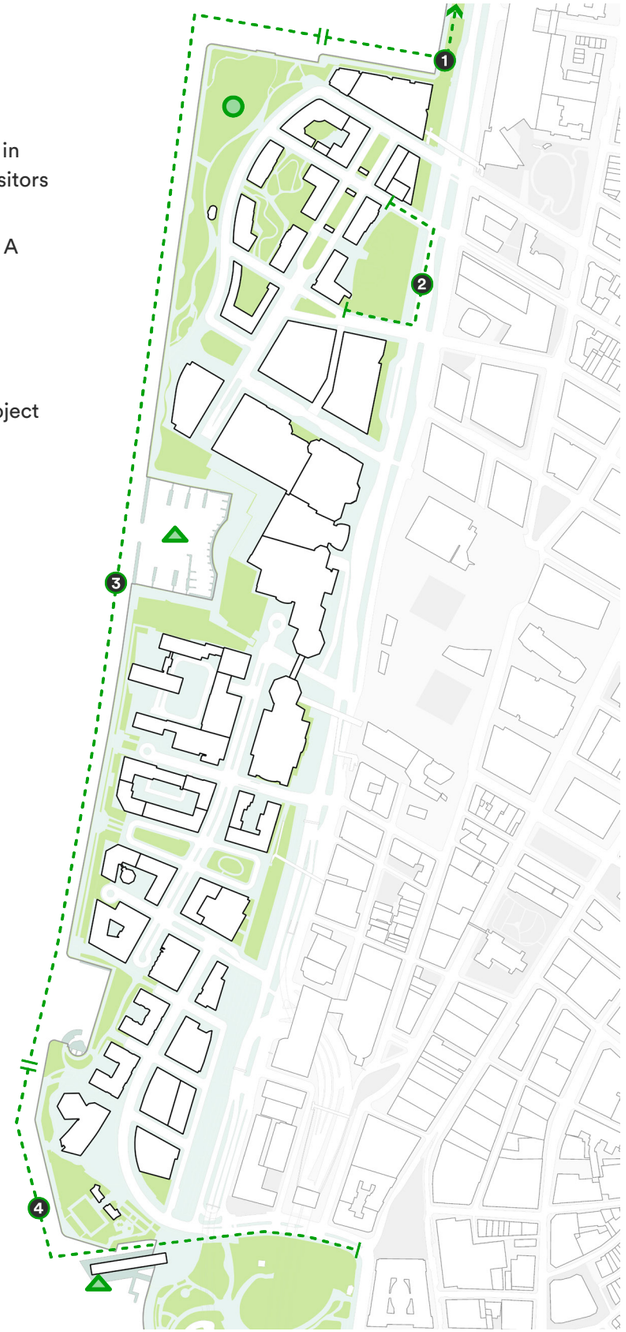
Notably, the air quality in Battery Park City is primarily governed by the air quality in New Jersey, as the prevailing winds are from the west and southwest. Despite this, localized emissions may also impact the air quality. Vehicular traffic, both on local streets and along the main thoroughfares of the West Side Highway and the Hugh L. Carey Tunnel entrance, may contribute to pollutant levels. Additionally, ferries docking at the Battery Park City/Brookfield Place Ferry Terminal affect localized air quality, although the extent of their impact is not easily quantifiable.

These air quality issues are common in urban areas, and specifically in Manhattan. To remedy this, the first approach must be to limit the sources of these pollutants. Some of this can be achieved by changing transportation patterns in the neighborhood or upgrading and improving fuel-consuming equipment (such as boilers or generators). However, some of these are outside of Battery Park City's control—resulting from citywide trends, or originating in New Jersey.

Battery Park City has 14 open spaces of varying types (plazas, walkways, parklands, gardens, ball fields) totaling over 1.1 million square feet, as well as 680 street trees, which can mitigate against air quality issues.[35] There is potential, however, for these spaces to be improved to better mitigate against these issues. Landscape strategies can also have the co-benefits of improving comfort (apparent temperature) in the summer and mitigating cold winds in the winter. These comfort and quality of life improvements for pedestrians will in turn help promote active transportation use.

Site Highlights

- Rockefeller Park is the busiest park/open area in Battery Park City, with over 2,000 weekend visitors
- The Billion Oyster Project has outposts at Pier A and the North Cove Marina
- 1 North BPC Resiliency Project
- 2 Ball Fields & Community Center Resiliency Project
- 3 West BPC Resiliency Project
- 4 South BPC Resiliency Project



Site Strategies

Strategy 1: Biodiversity and habitats

Strategy 2: Quality of life

Strategy 3: Environmental monitoring and data sharing

Strategy 4: Active transportation

Strategy 5: Electric vehicle infrastructure

Biodiversity and habitats [S-1]

I&I E&C

Strategy Description

Enhance the biodiversity of plant and animal life at Battery Park City and ensure that the wildlife is resilient to the changing climate

Battery Park City is a biodiverse site, and the 2019 Resilience Action Plan affirmed its commitment to being a biodiversity haven. Plant species in Battery Park City can thrive in a wide range of temperatures and are generally well-adapted to the changing climate, but there are some exceptions, as the biodiversity—which can be partially measured by the number of species per acre—varies across the neighborhood. All parks and open spaces in Battery Park City should target higher biodiversity, which would improve their resilience to different climatic conditions, improve their ecological health, and provide and support broader ecosystem services. Moving away from land, there are also opportunities to improve marine ecosystems, such as off the edge of the Esplanade bulkhead. Expanding ecosystem projects like the Billion Oyster Project installation sites at Pier A and the North Cove Marina and improving Battery Park City's "edge" are beneficial for water ecosystem health. In turn, improved ecosystem health will passively enhance the environmental health for Battery Park City's residents, workers, and visitors. Additionally, these individuals can have an active part in realizing improved ecological health in Battery Park City. Education events, such as "BioBlitz" survey events of flora and fauna or horticultural management events overseen by BPCA, can promote community awareness of ecological health and sustainability.

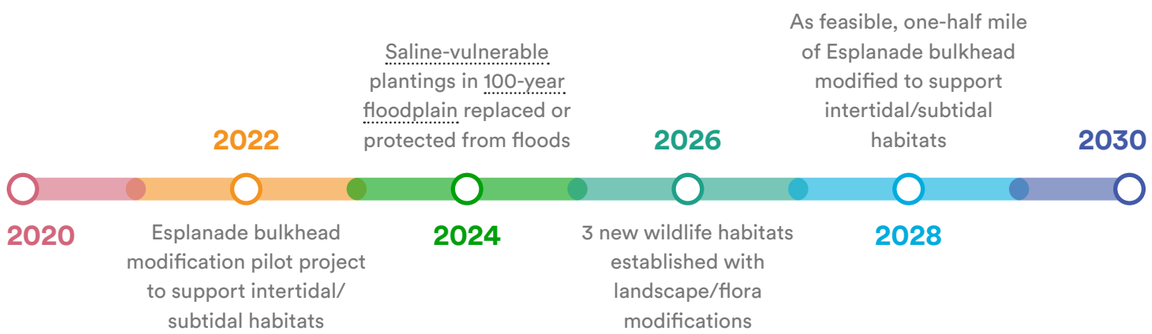
2030 Target

Battery Park City Authority Spaces

Target: Establish and advance toward appropriate biodiversity index targets for each park area

Baseline: Plant species richness, measured as number of species/cultivars per acre, varies across parks and Esplanade areas (26 to 140 species/acre)[36]

Supporting Milestones



Actions

	BPCA-led	BPC-wide
Maintain status as a leader in sustainable parks and open spaces		
• Formalize a role to document and manage wildlife inventories (E)	✓	
• Develop a BPCA Parks Standard Operating Procedures (SOP) for sustainable landscape management (E)	✓	
Raise awareness about Battery Park City's rich biodiversity		
• Host "BioBlitz" education events, where the community can participate in learning about and inventorying plant species	✓	
• Develop biodiversity signage throughout Battery Park City to highlight different species (E)	✓	
• Facilitate walking tours of Battery Park City with biodiversity-related topics such as birds, insects, or plants (E)	✓	
• Partner with BPC schools to establish "in-the-field" biodiversity education programs (E)	✓	
Enhance and expand existing habitats		
• Conduct a simplified audit of biodiversity within park and Esplanade spaces over 0.75 acres, excluding special landscapes (such as paved plazas/memorials), to calculate a biodiversity index for each space	✓	
• Provide support for buildings that have already installed green roofs to enhance their habitat functionality	✓	✓
• Study and establish flora and fauna patches and corridors to enhance local biodiversity as well as contribute to the larger urban ecosystem	✓	
• Connect with NYC Department of Parks and Recreation (DPR) and the Hudson River Park Trust to coordinate broader ecosystem planning efforts and potential habitat linkages	✓	
• As feasible, develop subtidal and intertidal habitats along the Esplanade bulkhead	✓	
Ensure that plants are resilient to the changing climate		
• Consider salinity-resilience in park plantings (E)	✓	
• Phase out plant species that are not adapted to changing climate / hardiness zone	✓	

Biodiversity at Battery Park City

Battery Park City has 680 street trees, 72 park trees, 406 shrubs, 1,138 perennials, 214 bulbs, 26 vines, and 25 annuals spread across 13 parks and streetscape areas, constituting a robust and diverse set of plantings. Depending on the type of space, biodiversity capacity can vary. For example, Pier A Plaza serves a different purpose than Rockefeller Park (which has 285 species).

(E) Items suggested during stakeholder engagement or at BPCA internal pop-ups

Quality of life

[S-2]

I&I E&C

Strategy Description

Improve the environmental quality and pedestrian environment of Battery Park City by addressing air quality, noise pollution, and the urban heat island effect

In addition to its parks and open spaces, Battery Park City has 680 street trees for approximately three miles of roads—more than twice the city average. At an urban scale, greenery, and street trees in particular, provide several environmental quality enhancements—improving air quality, sequestering carbon, reducing the urban heat island (UHI) effect, blunting the force of cold winter winds, and improving the physical and mental health of pedestrians. However, most street trees in Battery Park City were planted before the establishment of street tree planting best practices, including guidelines for providing root space for sustainable growth and structural support systems to prevent compression from adjacent sidewalks. For Battery Park City, streetscape and park design should be studied through these various lenses, and the resulting designs, planting decisions, and horticultural management practices should be optimized to further accentuate the positive impacts greenery can have for the neighborhood. Following a study of the "microclimates" and wind conditions in Battery Park City, landscape planting strategies can be selected that improve the quality of life for pedestrians, which would further promote active transportation and health and wellbeing.

2030 Target

Battery Park City

Target: 720 street trees by 2030

Baseline: 680 street trees in 2015[37]

Supporting Milestones

- **2020** — Developed tree planting standards and tree-replacement policy during construction
- **2022** — 0.5 miles of street (or other hardscape) redesigned with cool pavement
- **2024** — 25% of street trees have improved tree pits
- **2026** — 1.5 miles of street redesigned with cool pavement
- **2028**
- **2030**

Actions

Mitigate the Urban Heat Island (UHI) effect	BPCA-led	BPC-wide
• Measure and assess the Battery Park City tree canopy, including both streets and parks/open spaces	✓	
• Study existing microclimates and wind conditions in Battery Park City	✓	
• Increase the density of street trees and park trees in less dense areas (E)	✓	
• Install shading structures on sidewalks and in parks/open spaces to decrease the heat index	✓	
• Implement cool surfaces for sidewalks, roadbeds, and other hardscape areas in parks and open spaces (as appropriate)	✓	

Mitigate high winds, noise pollution, and air pollution	BPCA-led	BPC-wide
• Consider planting strategies and wind barrier installations to mitigate winter wind effects while accentuating cooling summer breezes	✓	
• Study the planting of additional park trees and shrubs adjacent to the Battery Park City ferry terminal to determine the sound dampening and air pollution mitigation effects (E)	✓	

Protect landscape environments during construction activities	BPCA-led	BPC-wide
• Develop a standard for tree plantings and tree bed care, as well as protection standards during construction activities	✓	
• Develop a tree replacement policy that requires that during construction, a replacement tree or trees must sequester the same amount of carbon dioxide within 5 years as the tree before	✓	

South Cove

Environmental monitoring and data sharing

[S-3]

I&I

Strategy Description

Measure site environmental conditions and building performance, use it to improve BPCA's operations and decision-making, and share this data with the public

As it manages the parks and public spaces of Battery Park City, BPCA has the opportunity to upgrade the public realm to provide more "active" features, such as weather and air quality monitoring, expanded free public WiFi, and display panels, which provide residents, employees, and visitors alike with real-time information. This environmental data can be used to optimize parks and open space planning and maintenance operations, as more granular weather and environmental data can aid BPCA's Park Operations Department better understand ecosystem health and work to enhance it. Similarly, the installation of specialized monitoring systems inside buildings can be used to track energy and water performance data, which could be shared with property managers and tenants to better understand their progress toward sustainability targets and enable BPCA to provide detailed guidance to them on how to improve. In 2019 BPCA commissioned a "Smart Cities Technology" study which provided an overview of the technology options which could be considered for Battery Park City. Moving forward, this report can serve as an evaluation tool for considering future smart city infrastructure projects in Battery Park City.

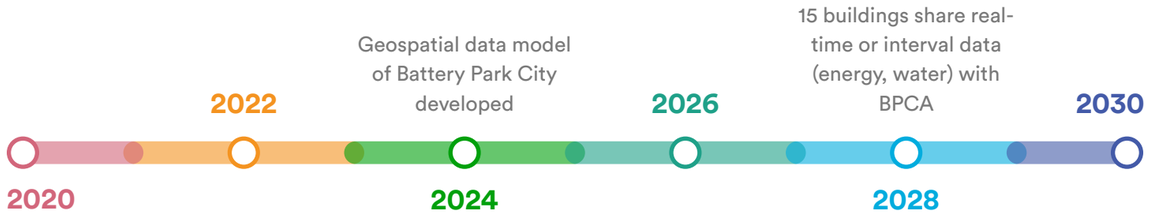
2030 Target

Battery Park City Authority Spaces

Target: Install air quality monitors, weather stations, and noise sensors, and share this environmental data with the public by 2030

Baseline: BPCA has one weather station, located in a plant nursery on North End Avenue

Supporting Milestones



Actions

	BPCA-led	BPC-wide
Increase internet connectivity in Battery Park City		
• Where appropriate, replace existing light poles with multi-feature "smart poles" that have light sensors for auto-dimming, expanded free public WiFi, and other features	✓	
Monitor environmental quality and provide real-time data to the public		
• Study potential locations and financing mechanisms to install localized air quality, temperature and humidity, wind, and noise sensors throughout Battery Park City (E)	✓	
• Explore the installation of public display panels which provide visitor information, real-time information (weather, mobility, etc.), and updates on sustainability initiatives at Battery Park City	✓	
Develop digital tools for asset management and expand smart city initiatives		
• Develop a data model of Battery Park City's buildings and public spaces, to be used for internal asset management and as the basis of a public-facing mapping platform and environmental and building performance data-sharing gateway	✓	
• Work with property managers and building owners to share data from building Energy Information Systems (EIS) to a BPCA-managed data platform, on a real-time or interval-reported basis	✓	

Weather Station at the North End Avenue Nursery

Active transportation [S-4]

RM&R E&C

Strategy Description

Change commuting and transportation patterns so that more people choose non-motorized travel such as walking, biking, or scootering

Most people (99%) who work in Battery Park City live in another neighborhood, and commute to the neighborhood for work. For residents of Battery Park City, 86% use public transportation, walk, bike, or work from home, and 14% either drive or carpool—a mode share similar to Manhattan at-large. Although transit use is high, vehicle miles traveled (VMT) can be further reduced by disincentivizing vehicle use through street design choices. At the same time, an unknown amount of logistics trips occur every day to deliver packages to residential and commercial buildings (an ever-growing trend), as well as to deliver inventory stock to retail establishments such as restaurants and shops. Similarly, a number of private commercial waste haulers circulate through Battery Park City at night to collect waste from retail and commercial properties. These logistics trips result in sound and air pollution nuisances from idling vehicles, as well as create safety issues from blocked crosswalks and bicycle lanes, and limited visibility around trucks. Through centralized logistics and commercial waste management, these “nighttime nuisances” can be mitigated.

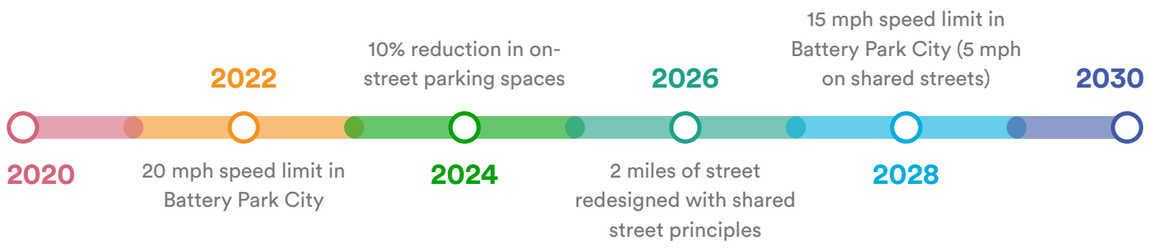
2030 Target

Battery Park City

Target: All streets redesigned for pedestrian safety by 2030

Baseline: Streets follow the NYC speed limit (25 mph)

Supporting Milestones



Actions

	BPCA-led	BPC-wide
Prioritize shared streets design principles in street redesigns to encourage lower speeds and safer streets		
• Evaluate opportunities and locations for the reduction of on-street parking (E)	✓	
• Improve/install bike and pedestrian facilities, such as curb extensions, street narrowing, and bike lanes (E)	✓	
• Incorporate high-contrast and/or raised pavement treatments at intersections, as well as mid-block crossings, to enhance safety for pedestrians and bicyclists (E)	✓	
• Install road and other wayfinding signage to protect against pedestrian-bicyclist conflicts	✓	
• Develop a plan for improving ride-sharing logistics and minimizing traffic	✓	
Encourage commercial tenants to promote 100% transit/non-motorized transportation	BPCA-led	BPC-wide
• Educate commercial tenants on transportation demand management (TDM) strategies, such as transit pass subsidies, providing employee shower facilities, and flextime/ telecommute options		✓
Reduce heavy vehicle trips through Battery Park City	BPCA-led	BPC-wide
• Centralize waste collection points on-site to limit garbage truck trips through the neighborhood	✓	
• Encourage retail tenants to coordinate logistics and seek "cargo sharing" opportunities		✓
• Establish north and south logistics centers for residential packages (E)	✓	

CitiBike docking station at West Thames Street

Electric vehicle infrastructure

[S-5]

I&I E&C

Strategy Description

Expand the availability of electric vehicle charging infrastructure to transition from gasoline-powered vehicles to electric vehicles, electric bikes, and electric scooters

BPCA has a fleet of 19 electric vehicles (EVs) and two fuel-powered vehicles for its operations and maintenance, in addition to lawn mowers and other specialized equipment that use fuel to operate. By contrast, New York City at-large has less than 1% electric vehicles. The MTA has a bus fleet of nearly 6,000 vehicles, but as of 2019 only a few dozen are all-electric and leased as part of pilot programs.[38] Similarly, the free Downtown Connection buses that traverse Lower Manhattan are not electric, running a fleet of Ford E-450 trucks. Even with the efforts to reduce passenger and commercial/logistics VMT, motorized vehicles will continue to have access to Battery Park City. As some amount of vehicle traffic will remain, Battery Park City should be more accommodating to EVs. Switching to EVs is a key State initiative to meet carbon reduction goals. EV switching is actively funded by NYSERDA, which provides rebates to consumers for EV purchases as well as to public/private organizations that install Level 2 EV charging infrastructure. By expanding the EV charging infrastructure in Battery Park City, the community can outpace the city in EV adoption, helping to meet carbon neutrality goals in addition to reducing localized emissions.

2030 Target

Battery Park City Authority Spaces

Target: 100% of BPCA vehicles are EVs by 2030

Baseline: Non-electric vehicles are used by BPCA for certain maintenance and operations procedures

Battery Park City

Target: 25% of public realm (curbside) parking spaces are upgraded to allow EV charging by 2030

Baseline: 0% of public realm (curbside) spaces are for EV charging in 2019

Supporting Milestones

- **2020**
- **2022** — 50 electric scooter and/or electric bike public realm charging spaces
- **2024** — 20 curbside EV charging spaces
- **2026** — 500 EV charging spaces in building parking garages
- **2028** — 200 electric scooter and/or electric bike public realm charging spaces
- **2030**

Actions

Expand EV charging infrastructure across Battery Park City to incentivize the transition to EVs, electric bicycles, and electric scooters	BPCA-led	BPC-wide
• Install curbside electric bicycle/scooter charging infrastructure (E)	✓	
• Work with partner organizations to install curbside Level 2 EV charging stations	✓	
• Connect building owners to EV charging station installation partners and financing	✓	
• Mandate EV-ready and EV-installed spaces for any new construction that has parking	✓	
• Retrofit existing parking structures to have EV-installed spaces (E)		✓
• Replace BPCA's on-road/off-road vehicle fleet with 100% electric vehicles, and explore opportunities for biofuels for other maintenance/specialized equipment	✓	

BPCA's Electric Vehicles

BPCA Parks Operations has a fleet of 19 electric vehicles, which logged approximately 5,000 miles in the 2019 fiscal year. This saved over 2,000 kgCO2e in emissions compared to gas- or diesel-fueled vehicles.

Appendices

7

Glossary

#	80×50	A target to reduce greenhouse gas emissions 80% by the year 2050.
	100×50	A target to reduce greenhouse gas emissions 100% by the year 2050, also referred to as "carbon neutrality."
	100-year Floodplain	The area that is susceptible to flooding during a 100-year flood, or a flood event that has a 1 in 100 chance of occurrence in any given year.
A	Active Transportation	A mode of transportation that includes walking, running, biking, skateboarding, traveling by scooter, and other human-powered forms of transportation.
	Adaptation	The effort to adjust practices and development in response to climate change in order to lessen future impacts.
	Audit	Energy, water, or waste audits. The practice of documenting existing conditions and current performance and recommending improvements to reduce energy or water consumption, or the amount of waste sent to landfills.
B	Battery Storage	A type of energy storage that stores power from the grid or local renewable energy generation for use in offsetting peak electricity consumption or as back-up energy for added resilience. See "Energy Storage."
	Biodiversity	The variety and variability of flora, fauna and ecosystems. Biodiversity supports many aspects of human life from food and medicine to environmental quality.
	Biodiversity Index	A relative scale of how many plant or animal species are in a defined area (e.g., plants per acre). As the types of species can vary, biodiversity indices are generally calculated for different target populations (separate index calculations for plants, for birds, for insects, etc.).
	Biomass	Plant or animal materials that can be used for fuels, power production, and products that would otherwise require fossil fuels. Also called bioenergy.
	Bioswale	A type of green infrastructure. Shallow trenches that retain and direct stormwater runoff while passively removing debris and pollution with vegetation.
	BIPV	See "Building Integrated Photovoltaic."

	Blackwater	Wastewater generated from toilets that may have fecal contamination. Blackwater requires extra levels of treatment for safe reuse.
	Brackish Water	A mix of saltwater and freshwater, such as the water found in the Hudson River by Battery Park City.
	Building Envelope	The physical separator between the interior and exterior of a building including the resistance to air, water, heat, light, and noise transfer.
	Building Integrated Photovoltaic	Solar photovoltaic materials that are used in parts of a building envelope to generate power. Building integrated photovoltaics are typically installed on roofs or facades.
C	C&D	Construction and demolition
	Carbon Dioxide (CO_2)	CO_2 is a greenhouse gas made up of one carbon atom and two oxygen atoms that is released primarily through the burning of fossil fuels, other hydrocarbons, solid waste, and trees and wood products.
	Carbon Dioxide Equivalent (CO_2e)	CO_2e is a composite unit that expresses the relative global warming impacts of other gases (methane, for example, is far more potent than CO_2).
	Carbon Footprint	The total greenhouse gas emissions caused by an individual, event, organization, or product, expressed as carbon dioxide equivalent (CO_2e).
	Carbon-Intensive	Any activity or product that requires a high carbon footprint for completion.
	Carbon Neutral	A system or jurisdiction that has net zero greenhouse gas emissions. Carbon neutrality may require carbon sequestration technologies to capture the remainder of GHG emissions or, as a last resort, rely on carbon offsets.
	Carbon Sequestration	The process of capturing and storing atmospheric carbon dioxide in an effort to mitigate climate change.
	CCA	See " Community Choice Aggregation".
	Circular Economy	An economic system that aims to eliminate waste and preserve resources for continual reuse and restoration.

CLCPA	New York State legislation "Climate Leadership and Community Protection Act."
Clean Energy	Energy resources that are derived from renewable, zero-emission sources such as solar, wind, and hydropower.
Clean Power	Power that is generated from clean energy sources. See "Clean Energy."
Climate Action	Action that is taken to either reduce the impacts of climate change or prevent climate change from worsening in the future, or both. In the context of Battery Park City, climate action includes all those measures enacted in the neighborhood to achieve carbon neutrality by 2050.
Cogeneration	A system in which electricity is generated and the waste heat from the process is captured for heating purposes.
Combined Sewer Overflow	A discharge from a Combined Sewer System that is caused by large amounts of rainfall. Combined Sewer Overflows contain a mixture of domestic sewage, stormwater runoff, and sometimes industrial wastewater that can pollute local water bodies. See "Combined Sewer System."
Combined Sewer System	A sewage collection network that collects both stormwater runoff and sewage water in a shared system. See "Combined Sewer Overflow."
Community Choice Aggregation	A program that allows for local governments or agencies to procure energy supply and distributed energy resources for eligible customers in the community. Community choice aggregation allows communities to work together with a shared purchasing model that can reduce the cost of energy and increase the amount of renewable energy provided to the community.
Compactor	A centralized location for collecting, combining, and densely packing waste that is to be sent to a landfill.
Compost	The product, rich in nutrients, resulting from the decomposition of organic material in a composter. Material used to make compost include landscape trimmings, agricultural crop residues, paper pulp, food scraps, and wood chips.
Cool Surfaces	High albedo, or reflective, surfaces that reflect more light and trap less heat than conventional surfaces. These surfaces can help mitigate the heat island effect. Examples include cool roofs, green roofs, or light colored pavement and roads.

Cooling Tower	Cooling equipment that is used to reject heat from a chilled water system, often located on the roof of a building.
Cradle to Cradle Certified	A globally recognized measure of safer, more sustainable products made for the circular economy. For certification, products are assessed for: material health, material reuse, renewable energy and carbon management, water stewardship, and social fairness. (Source: Cradle to Cradle Products Innovation Institute.)
Critical Facilities	Those facilities that carry out essential community functions and are particularly important during or after a disaster.
CSO	See "Combined Sewer Overflow."

D

Decarbonization	The process of reducing embodied and operational greenhouse gas emissions.
Decentralized Energy System	See "Distributed Energy Generation."
Declare Database	A platform and product database created and managed by the International Living Future Institute (ILFI) for identifying healthy products. The Declare label includes information on where a project comes from, its embodied carbon, end of life options, and whether it contains red list materials, among other information.
Deep Energy Retrofits	Major changes to the structure or systems of an existing building for the purpose of achieving significant reductions in energy consumption (and operational costs) with the use of more efficient technologies, products, and designs. Deep energy retrofits may also reduce water consumption and improve occupant amenities. consumption and costs, and reduce GHG emissions and meet NYC building emission compliance targets.
Demand Response	The process of managing electricity loads during peak periods that either reduces or shifts the peak power load to reduce demand costs.
Dematerialization	The design of a building or infrastructure that minimizes the amount, or the impact, of the materials used. Dematerialization can reduce the embodied carbon of a project.
DEP	New York City Department of Environmental Protection
Distributed Energy Generation	Systems in which energy production facilities are located closer to the site of consumption. Distributed generation is the optimal use of renewable energy and can reduce any power transmission and distribution losses.

	District Energy System	District energy systems consist of a central plant and distribution network for the generation and delivery of heating, cooling and potentially power to buildings and spaces in a community. District energy systems are able to balance loads throughout the community and achieve energy savings due to their efficiency.
	District Steam	In NYC, ConEd supports a city-scale high-pressure steam network that many buildings connect to for heating and potentially cooling systems.
	Diversion Rate	The amount of waste that does not end up in landfills either through recycling, reuse, composting, or another method. See "Waste Diversion."
	DOB	New York City Department of Buildings
	DOT	New York City Department of Transportation
	DPR	New York City Department of Parks and Recreation
	Drip Irrigation	A type of irrigation system that provides water directly to a plants roots at a slower rate than sprinklers or hoses. Drip irrigation can reduce the amount of water needed for irrigation by reducing the amount of evaporation.
	DSNY	New York City Department of Sanitation
E	Economies of Scale	The cost advantage that is obtained due to the scale of an operation, with cost per unit of output decreasing with increasing scale.
	Ecosystem	A biological community of interacting organisms and their physical environment.
	Ecosystem Services	Benefits people obtain from ecosystems, such as the food, fresh water, fuel, fiber, climate, water, disease regulation, pollination, soil formation and nutrient cycling; and education, aesthetics, cultural heritage values, recreation and tourism. (Source: United States Department of Agriculture.)
	Electric Vehicles	An umbrella term to describe a variety of vehicle types that use electricity as their primary fuel source for propulsion or as a means to improve the efficiency of conventional internal combustion engine.

	Electricity Generation Mix	The mix of energy sources used to generate electricity for the grid. The electricity generation mix will impact the GHG emissions associated with electricity consumption in a community.
	Electrification	The process of transitioning building heating, hot water, and cooking equipment away from fossil fuel equipment and toward electric equipment. Electrification of building systems paired with a power grid with 100% renewable energy sources can significantly reduce GHG emissions.
	Embodied carbon	Embodied carbon is the GHG emissions footprint of a product or materials. The emissions associated with a product or material come from its production, transport, use, and disposal.
	Emissions	Gases and particles which are put into the air or emitted by various sources. See "Greenhouse Gases."
	Energy Information System	Web-based software that is used to collect, track, analyze, and display building energy data.
	Energy Storage	Technologies that collect generated energy so it may be used at another time. Energy storage includes electric systems such as batteries as well as thermal systems such as hot and cold water storage tanks.
	Energy Tariff	A method of charging a consumer for consuming energy. A tariff defines the service charges, time of use periods, or consumption tiers.
	Energy Service Company	A business that provides a wide range of services for reducing energy consumption from design and implementation to financing.
	Environmental Footprint	The impact of a development or community on the local environment including its resource demand such as energy, water, and goods and materials.
	ESCO	See "Energy Service Company."
	EV	See "Electric Vehicles."
	Flora and Fauna Patches	Habitat patches are specific, discrete areas often established within a larger park, open space, or natural area with the purpose of providing a breeding or feeding area for flora or fauna.
F	Fossil Fuels	Hydrocarbon fuels formed over millions of years by natural processes such as the anaerobic decomposition of organic matter. Typical fossil fuels include coal, oil, and natural gas.

G	Geothermal Energy	A renewable energy source. Geothermal energy utilizes the natural thermal energy generated and stored in the Earth.
	Green Infrastructure	A method for naturally managing rainfall. Green infrastructure reduces and treats stormwater runoff while also improving the local environment by mimicking natural processes. Green infrastructure includes strategies such as green roofs, bioswales, and rain gardens. See also "Grey Infrastructure."
	Green Leases	Rental agreements where tenants commit to defined standards for sustainability such as energy efficiency, water conservation, or waste reduction and recycling.
	Green Roof	A building roof that is partially or completely covered with vegetation. Green roofs can reduce the Urban Heat Island effect, improve stormwater management, and reduce cooling demands in a building.
	Greenhouse Gases	Gases that trap heat in the atmosphere by absorbing and emitting solar radiation within the atmosphere, causing a greenhouse effect that warms the atmosphere and leads to global climate change. The main human-made GHGs are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons.
	Grey Infrastructure	Grey infrastructure refers to the traditional means for managing stormwater such as with constructed assets or structures and is often made up of concrete primarily. See also "Green Infrastructure."
	Greywater	Wastewater generated in homes and offices, sourced from baths, sinks, washing machines, or kitchen appliances. Greywater may contain amounts of dirt, food, grease, or cleaning products, but does not have fecal contamination.
H	Habitat Linkages	Natural areas that connect patches of habitat to each other so that local species can travel between otherwise isolated patches of habitat.
	Hardiness Zone	An area that is defined by its ability for certain plant species to thrive. Hardiness zones are based on the annual minimum winter temperature of an area.
	Hardscape	Paved areas such as asphalt roads, concrete sidewalks, and stone pathways, as well as outdoor water features (such as ornamental fountains/ pools) which are impermeable. See also "Permeability" and "Stormwater Infiltration."
	Heat Sink	The process of transferring heat to another medium, often water, that removes heat from the main system (such as an HVAC system).

	High-Emission Fuel Oil (Heavy Oil)	Types of fuel oil—fuel oil #5 and #6—that are thicker and more viscous. These types of oil are often contaminated with different compounds such as sulfur and nitrogen and mean that upon combustion, these oils are much more carbon-intensive than others. Fuel oil #6 is illegal in NYC.
	Horticulture	A type of agriculture that is focused on fruit, vegetables, flowers, and landscapes plants.
	HVAC	Heating, ventilation, and air conditioning systems
I	Intertidal Habitats	Habitats that thrive in the area of a shore that is above water level at low tide and underwater at high tide.
L	LEED	Leadership in Energy and Environmental Design (LEED) is a rating system devised by the United States Green Building Council (USGBC) to evaluate the environmental performance of a building.
	LL97	See "Local Law 97."
	Local Law 97	A piece of NYC legislation that was passed as part of the 2019 Climate Mobilization Act (CMA). LL97 establishes and enforces strict carbon emission targets for different building use typologies. LL97 sets carbon emission targets for the years 2024 to 2029 and 2030 to 2034.
M	Materials Petal	A certification pathway from Living Building Challenge. The Materials Petal includes several imperatives including a materials red list, embodied carbon footprint, responsible industry, living economy sourcing, and net positive water.
	Methane (CH4)	A gas made up of one carbon atom and four hydrogen atoms. Methane is the main component of natural gas, commonly used as a fuel for heating. Methane is released during the production and distribution of natural gas but also through livestock and other agricultural practices and by the decay of organic waste in landfills. Methane is a greenhouse gas with a much higher global warming potential than carbon dioxide meaning methane has a much larger effect than the same amount of CO2.
	Microclimate	The climate of a small area with a distinct set of environmental variables such as temperature, light, wind speed, or moisture.
	Mitigation	Actions that aim to limit the amount of GHG emissions that are released into the environment. See also "Climate Action."

	Mixed-use	A mixed-use community or development is one that blends two or more space use types together such as residential, commercial, cultural, institutional, and/or industrial.
	Mode Share	The proportion of different transportation modes, or form of travel, used in a community. Typical modes include walking, traveling by automobile, traveling by bus, or traveling by train.
	MS4	See "Municipal Separate Storm Sewer System."
	MTA	New York State Metropolitan Transportation Authority
	Municipal Separate Storm Sewer System	An underground network that is designed or used for collecting and conveying stormwater that discharges to local water bodies. In comparison to a Combined Sewer System, MS4 acts as stormwater infrastructure separate from domestic sewer infrastructure.
N	Net Zero Carbon	A system, process, building or community that mitigates any operational greenhouse gas emissions associated with its resource use or does not use energy sources that contribute greenhouse gas emissions.
	Net Zero Emissions	See "Net Zero Carbon."
	Non-Motorized Transport	See "Active Transportation."
	Non-Potable Demand	Water demand that do not require water quality to achieve potable standards. Non-potable demands may include irrigation, heating/cooling applications, or process water needs. See also "Potable Water."
	NYPA	New York Power Authority
	NYPD	New York Police Department
	NYSERDA	New York State Energy Research and Development Authority
O	Off-take	In the context of solar and wind power facilities, an agreement to purchase part of the energy being produced.
	Operational emissions	GHG emissions that occur during the day-to-day operation of a building or community including activities like energy use or commuting.
	Organic Waste	Biodegradable waste containing materials from living organisms. Organic waste may include food waste, green waste, landscaping and pruning waste, nonhazardous wood waste, or food-soiled paper waste that is mixed in with food waste. Organic waste is often processed using composting.

P	Passive House	The Passive House Institute US (PHIUS) Passive Building Standard requires progressive design considerations for the building envelope, air tightness, high-performance windows and doors, heat recovery and moisture recovery ventilation techniques and optimized solar gain through the facade.
	Pedestrian facilities	Street design features that promote pedestrian safety and active transportation, such as crosswalks and mid-block crossings, median extensions and refuge islands, raised/tabled intersections, and speed bumps.
	Permeability	The ability of a surface to allow stormwater infiltration. See also "Stormwater Infiltration."
	Potable Water	Water that meets potable water quality standards, or water that is safe to drink.
	Purple Pipe Network	A piping system for recycled water. A purple pipe network connects water treatment equipment with wastewater sources to provide treated water to a community for reuse.
	PV	Photovoltaics, commonly referred to as solar PV or solar.
R	Rain Garden	A type of green infrastructure meant to collect stormwater runoff for detention. A rain garden aims to improve the infiltration of stormwater through deep rooted plants.
	Real Time Energy Consumption / Real Time Energy Management	Real time energy data is collected using cloud-based sensors and equipment and sent to a management platform where it is automatically analyzed and anomalies are identified for building operators to investigate. Live and historical energy data can be a useful tool for identifying opportunities for energy savings.
	Red List Materials	A list of materials developed by the International Living Futures Institute that are the worst in class based on their harmful chemical use. Red list items are known to pollute the environment, bio-accumulate in the food chain until they reach toxic concentrations, or harm construction and factory workers.
	Renewable Energy Sources	Energy that comes from resources which are naturally replenished on a human timescale, such as sunlight, wind, tides, waves, bioenergy, hydrogen and geothermal.

	Resiliency	The capacity to survive, adapt and thrive in the face of chronic stresses and acute shocks and to even transform as conditions require.
S	Saline-Vulnerable	Plants that are susceptible to salt damage exacerbated by sea level rise and salt-based ice melting practices.
	Salinity-Resilience	Plants that are resilient to salt and saltwater. These plants are ideal for coastal zones that might be impacted by sea level rise and coastal flooding.
	Shared Street	Streets that are designed for low vehicle speeds, removing formal distinctions between pedestrian, cyclist, and vehicle spaces.
	Single-Use Materials	Disposable materials that are used only once before they are thrown away or recycled. Food packaging, plastic bags, straws and water bottles are all examples of single-use materials.
	Smart City Infrastructure	Infrastructure in a community that utilizes internet of things technologies to collect data and utilize the data to manage operations and resources efficiently, improve sustainability, create economic development, reduce emergency response times, and enhance quality of life.
	Smart Meter	Digital meters that record energy or water consumption and communicate the information to the supplier or building operator for monitoring and billing.
	Smart Pole	A lamppost that can have a variety of different internet-connected features, such as light sensors for automatic dimming, WiFi hotspot, USB outlets, security cameras, and digital displays.
	Softscape	The horticultural elements of a site's landscape, such as grass, trees, shrubs, flowers, and other planted components. See also "Permeability."
	Sound Dampening	The process of reducing the resonance in a space through absorption or redirection of sounds.
	Stormwater Infiltration	The process by which surface stormwater enters the soil.
	Stormwater Management	The process of managing stormwater on-site either through methods such as infiltration, detention, or capture and reuse. Stormwater management includes managing the volume of rainfall to avoid flooding as well as ensuring that stormwater does not become polluted and runoff into local water bodies. See also "Green Infrastructure" and "Stormwater Infiltration."

	Sub-Meter	Individually meter and bill units based on consumption in a traditionally master-metered building (or one where a single meter measures the entire building's consumption). Sub-metering can also refer to separately metering different energy or water end uses, such as lighting separately from space conditioning, to better understand building energy use and identify potential maintenance issues or efficiency opportunities.
	Subtidal Habitats	Habitats that thrive in the area of a shore that is below low tide levels.
T	TDM	See "Transportation Demand Management."
	Thermal Energy Storage	A type of energy storage that stores thermal energy such as ice or hot water for use at a later time. Thermal energy storage can be utilized to reduce peak demands for heating and cooling. See "Energy Storage."
	Transportation Demand Management	Strategies to change travel behavior in order to reduce traffic congestion, increase safety and mobility, and conserve energy and reduce greenhouse gas emissions. Strategies may include ridesharing, telecommuting, park-and-ride programs, and alternative work schedules.
	Tree Canopy	The layer of tree leaves, branches, and stems that provide tree coverage of the ground when viewed from above. (Source: United States Department of Agriculture.)
U	UHI	See "Urban Heat Island."
	Urban Heat Island	A Urban Heat Island, is a dense urban area that experiences a higher average ambient air temperature than more rural areas. The Urban Heat Island effect is created by the heat associated with people, cars, buses, trains, and other activities.
V	Vehicle Miles Traveled	A measurement of miles traveled by vehicles within a specified region for a specified time period.
	VMT	See "Vehicle Miles Traveled."
	VOCs	See "Volatile Organic Compounds."
	Volatile Organic Compounds	Airborne chemicals that are given off by many indoor sources, such as paints or carpeting, and can pose health hazards to occupants.
W	Waste Diversion	The process of managing a waste stream such that waste products do not end up in landfills either through reuse, recycling, composting, or another method. See "Diversion Rate."

	Waste Heat Recovery	Methods for capturing and transferring waste heat back into a heating system. Waste heat recovery can reduce the energy needed to heat a building.
	Water Recycling Systems	Systems that capture and treat wastewater to acceptable standards for reuse. Water recycling systems often treat wastewater for non-potable use such as for irrigation but can also treat wastewater to potable standards for broader use.
	Water Reuse	The practice of capturing wastewater, treating it, and reusing it. See "Water Recycling Systems."
	Water Use Intensity	The amount of water consumed in a building per unit area. The metric is used to compare building performance within a certain building use type. Water use intensity is often reported in units of gallons per square foot per year.
	WELL Building Standard	A performance-based system for measuring, certifying, and monitoring building elements that impact occupant health and wellness. WELL analyzes building qualities such as air, water, nourishment, light, fitness, comfort, and mind. WELL certification is designed to work in parallel with other existing frameworks such as LEED, Living Building Challenge, or BREEAM.
Z	Zero Waste	A system, process, building or community that sends no waste to landfills by reducing consumption and maximizing recycling, reuse, and composting.

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Endnotes

1 Goal set for Battery Park City in the Battery Park City 2019 Resilience Action Plan.

2 New York City Mayor's Office of Sustainability, 2018 Energy and Water Data Disclosure for Local Law 84 (Data for Calendar Year 2017), December 2018.

3 Ibid.

4 Based on 2017 LL84 data. At present, emission limits are set for the 2024-2029 compliance period, and tentatively set for the 2030-2034 compliance period. These emissions limits correspond to changing emissions factors for different fuel types (namely electricity). The GHG inventory for Battery Park City uses actual 2017 NYC emission factors, which are lower than the prospective LL97 coefficients. Emissions conversion to miles driven via the EPA Greenhouse Gas Equivalencies Calculator.

5 New York City Local Law 97, 2019.

6 Based on Buro Happold analysis of Battery Park City LL97 compliance, 2019.

7 New York Independent System Operator (NYISO), "Power Trends 2019", February 2020.

8 New York City, "OneNYC2050", February 2020.

9 BPCA energy consumption totals via billing records (power) and as a ratio of the BPCA area to total building area for other fuels (such as natural gas) as reported in LL84.

10 Buildings' individual emission limits calculated using LL84 primary and secondary use types and energy consumption totals.

11 New York City Mayor's Office of Sustainability, 2018 Energy and Water Data Disclosure for Local Law 84 (Data for Calendar Year 2017), December 2018.

12 At present, there are two sources of renewable energy at BPC: on-site generation through solar PV generation and off-site renewables procurement at the Goldman Sachs building (200 West Street).

13 BPC Community and BPCA Organizational GHG Inventory for Calendar Year 2017.

14 Ibid.

15 New York City Department of Environmental Protection, "New York City's Water Supply System", December 2019.

16 New York City Mayor's Office of Sustainability, 2018 Energy and Water Data Disclosure for Local Law 84 (Data for Calendar Year 2017), December 2018.

17 BPCA water consumption via water bill records.

18 New York City Mayor's Office of Sustainability, 2018 Energy and Water Data Disclosure for Local Law 84 (Data for Calendar Year 2017), December 2018.

19 BPCA utilizes recycled greywater for water features in Teardrop Park.

20 Water recycling systems are present for five buildings (Millennium Tower, Riverhouse, The Solaire, The Verdesian, The Visionaire, and Tribeca Green).

21 Site permeability calculated via a land cover analysis.

22 Generation and composition estimates were calculated using citywide values reported for residential properties and schools by the New York City Department of Sanitation (DSNY), and the California Department of Resources Recycling and Recovery (CalRecycle) for all other property types.

23 Diversion rate for 75 Battery Place facility based on waste audit data collected by the Zero Waste Advisory Committee during 2019.

24 The current and potential diversion rates were estimated based on waste composition studies from CalRecycle and some waste generation and disposal data from select buildings at Battery Park City.

25 Ibid.

26 Amount of waste compacted at Battery Park City provided by DSNY.

27 Data on organic waste collected for composting provided by BPCA.

28 Data on the volume of dog waste collected for composting provided by BPCA.

29 75 Battery Place waste tracked by the BPCA Zero Waste Advisory Committee through waste audits.

30 Waste compactor totals tracked by BPCA.

31 Compost volumes tracked by BPCA. Diversion rate determined based on the waste composition assessment that estimates how much organic waste is generated in BPC in a single year.

32 BPCA, "BPCA Wildlife Census", November 2019.

33 U.S. Census, 2013-2017 American Community Survey 5-Year Estimates.

34 New York Police Department, "Motor Vehicle Collisions – Crashes", November 2019.

35 New York City Department of Parks and Recreation, “2015 Street Tree Census - Tree Data”, 2015.

36 BPCA, “BPCA Wildlife Census”, November 2019.

37 New York City Department of Parks and Recreation, “2015 Street Tree Census - Tree Data”, 2015.

38 Data from the Canadian Public Transit Discussion Board Wiki, MTA page.

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