



A RESET FOR RENEWABLE RIKERS

FEBRUARY 2026

ACKNOWLEDGEMENTS

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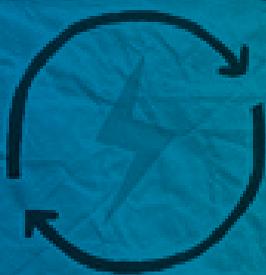
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KEY

TAKEAWAYS



**CLOSE RIKERS
TO RENEW IT!**

RENEWABLE ENERGY NOW!

The vision of Renewable Rikers represents one of New York City's most promising opportunities to meet City and State clean energy, decarbonization, and environmental justice and restorative justice goals. Due to its large, isolated nature and proximity to major load centers, Rikers Island offers a uniquely viable space for co-locating renewables, energy storage, and wastewater resource recovery infrastructure and composting within city limits. The analysis undertaken in this report builds on the City's Energy Study (2024) and the Wastewater Resource Recovery Facility (WRRF) Study (2024) to quantify the benefits of Renewable Rikers under varying build scenarios.

RENEWABLE ENERGY RECOMMENDATIONS

NEAR-TERM ACTIONS (2025–2030): EARLY DEPLOYMENT AND COORDINATION

1. Establish and fund a City-led Renewable Rikers Task Force.

- » Include representatives from the New York City Environmental Justice Alliance (NYC-EJA), Department of Environmental Protection (DEP), Mayor's Office of Climate and Environmental Justice (MOCEJ), New York Power Authority (NYPA), and community groups to oversee planning, engagement, and funding pursuits.
- » Develop a Master Plan integrating energy, WRRF, and environmental justice goals.
- » Account for the full suite of benefits and costs in all future planning, including all benefits of avoided fossil fuel emissions.

2. Align with statewide clean energy infrastructure planning.

- » Ensure that Renewable Rikers is integrated into the New York Independent System Operator (NYISO) System Resource Outlook and New York State Energy Research and Development Authority (NYSERDA) Transmission Planning scenarios.
- » Coordinate with parallel projects like Clean Path NY and Renewable Ravenswood to optimize grid benefits.

3. Initiate permitting and design for Phase I solar + storage.

- » Target readiness by 2030 to demonstrate site viability and deliver early clean capacity resources.
- » Pursue federal tax credits for storage before credit phasedowns (before 2032).

4. Engage offshore wind developers early.

- » Explicitly identify a primary and backup offshore wind project for Phase II connection (e.g. Beacon Wind, Empire Wind 2).
- » Coordinate on converter station design, construction sequence, and land requirements, timelines, and cost estimates.
- » Monitor offshore wind market developments, including permitting, construction timelines, and interconnection plans, to ensure that Renewable Rikers remains aligned with broader state energy strategies.

5. Clarify and secure transmission access.

- » Work with Con Edison and NYISO to confirm that they have a 3.5-GW hosting capacity and evaluate incremental expansion viability to 5 GW.
- » Explore waitlist opportunities for energy storage interconnection to ensure timely deployment and grid integration, including interconnection synergies with Brooklyn Clean Energy Hub and Astoria Substation.

6. Pilot long-duration energy storage technologies.

- » Partner with NYPA or NYSERDA to test ≥100-hour Long-Duration Energy Storage (LDES) systems to mitigate wind curtailment and enhance resilience.

MID-TERM ACTIONS (2030–2040): INTEGRATION AND OPTIMIZATION

7. Integrate solar and storage within WRRF design.

- » Incorporate rooftop solar and onsite battery storage into WRRF architectural plans to maximize synergies and resilience.

8. Conduct detailed transmission and curtailment studies.

- » Quantify cost-benefit trade-offs of curtailment vs. transmission expansion.
- » Evaluate alternative export pathways (e.g., DC links to Brooklyn or Queens nodes).

WASTEWATER RECOMMENDATIONS

The analysis undertaken in this report confirms the technical feasibility and transformative potential of the Renewable Rikers initiative. We offer the following recommendations:

1. The City should adopt a modular construction approach, beginning with the 135-acre core configuration to accelerate implementation. Phased deployment allows for adaptive learning and incremental integration of renewable systems while delivering early public health and economic benefits.
2. Renewable energy systems—including solar photovoltaics and battery storage—should be fully integrated into facility operations. Energy self-sufficiency will enhance resilience and reduce long-term operational costs. However, it is strongly recommended that there be a more rigorous evaluation and expanded modeling to incorporate compost processing and co-digestion scenarios. (A preliminary analysis is included in the Appendix.)
3. Governance mechanisms must embed transparency and equity. Establishing a Renewable Rikers Advisory Council, formalizing community oversight, and publishing quarterly progress reports will institutionalize accountability.
4. Workforce and contracting policies should codify local hiring mandates and small business participation goals, ensuring that the economic benefits of Renewable Rikers extend directly to historically marginalized communities.
5. Subsequent planning phases should include a detailed jobs-and-workforce assessment, with disaggregation by construction trades, engineering, operations, and maintenance roles, and with specific attention to local hiring, apprenticeship access, and equitable workforce pathways for environmental justice communities.
6. The City should position Renewable Rikers as a model for just transition, linking environmental remediation, infrastructure renewal, and social equity. With deliberate implementation, the project can redefine how major capital investments align with environmental justice.

COMPOSTING RECOMMENDATIONS

The City should commit to rebuilding and expanding the Rikers Island composting facility so that it can sustainably convert food scraps and yard waste into useful finished compost in quantities comparable to city's Fresh Kills composting operation, while ensuring that the size of this facility is compatible with the space requirements for the proposed wastewater resource recovery

facility and renewable energy infrastructure recommended in this report. The City should explore the opportunity to advance work on this composting facility as land is turned over from the Department of Correction to the Department of Citywide Administrative Services, even before all jail facilities on the island have closed.

INTRODUCTION

NYC-EJA is a founding member of the [Renewable Rikers](#) coalition, a movement to advance a green and restorative future for Rikers Island and the surrounding environmental justice communities. This coalition came together after the De Blasio administration's announcement that the carceral facilities on the island would be closed.

Alongside NYC-EJA, the coalition's leadership includes:

- » [Freedom Agenda](#)
- » [The Point Community Development Corporation](#)
- » [Independent Rikers Commission](#)
- » [Natural Resources Defense Council \(NRDC\)](#)
- » [Riverkeeper](#)

The Renewable Rikers vision came together to ensure that when the jails on Rikers are closed, the island's future uses benefit and respond to the wishes of both the people and communities that have been harmed through its long and painful history. Numerous conversations with people who have been incarcerated on Rikers and those whose loved ones were incarcerated led to a consensus to "use the island for green infrastructure through the Renewable Rikers Plan." After mounting advocacy efforts and overwhelming support in the City Council, the vision for this plan was legislated in early 2021 as the [Renewable Rikers Act](#).

For the first time in decades, the City of New York has a critical opportunity to reimagine

how to meet City and State climate goals while addressing long-standing structural inequities that have burdened environmental justice communities for generations. The passage of the Climate Leadership and Community Protection Act (CLCPA) in 2019 shifted the entire energy landscape in New York State. This legislation, which requires that 70% of the state's energy be generated by renewable sources by 2030 and 100% of the state's electricity be zero-emissions by 2040, creates a clear mandate for a green transition for the state and city. State government agencies are developing regulatory frameworks to meet these ambitious mandates, and advocates across the state are leveraging the law in every battle against the expansion of fossil fuel usage. Also legislated in 2019, Local Law 97 is the cornerstone of the Climate Mobilization Act and requires the buildings in New York City, which are the most polluting sector, to reduce emissions by 40% by 2030 and 80% by 2050.

The Renewable Rikers vision creates a hub of sustainability and resilience by developing a new wastewater treatment facility, large-scale renewable energy and battery storage technology, and composting facilities. These changes will collectively move us toward shutting down fossil fuel-burning peaker power plants and noxious aging wastewater treatment facilities that have been detrimental to environmental justice communities for decades. For too long, communities such as Hunts Point in the South Bronx have been disproportionately negatively

impacted by both the criminal justice system and environmental injustices. The Renewable Rikers vision represents a unique formation wherein for the first time environmental justice organizations are working closely alongside criminal justice advocates toward a shared vision for Rikers Island.

NYC-EJA's member organizations represent environmental justice (EJ) communities in NYC. These low-income communities and communities of color have been forced to live with fewer protections and greater toxic exposure, pollution, and health burdens than many other neighborhoods. Today, we see the legacy of these structural injustices among underserved communities in the South Bronx, Northern Manhattan, Northwest and Southeast Queens, North Brooklyn, the North shore of Staten Island and many more. Many of the same neighborhoods that are disproportionately subjected to noxious infrastructure are the same ones that have been disproportionately harmed by the carceral system.

In recognition of the public health harms directly associated with the pollution from fossil fuel infrastructure, this report focuses on the potential of renewable energy and modern wastewater treatment infrastructure on Rikers Island to alleviate the disproportionate burden of our existing fossil fuel-dependent infrastructure in EJ communities. The goal of this report is to take a closer look at the City-mandated feasibility studies (published by the Adams administration in March 2024) to both analyze underlying assumptions within the two reports, and to present a best-case scenario for what can be sited on the island that is forward thinking about the needs of local environmental justice communities and the City's and State's climate commitments.

PURPOSE OF REPORT

The election of former mayor Eric Adams in 2021 added a number of obstacles to the pathway to Renewable Rikers. Many of these obstacles were directly associated with the failure to close existing jails on the island or to advance construction of the approved borough-based jails. Despite supporting the vision of Renewable Rikers during his Mayoral campaign, once in office, Mayor Adams made many political decisions to stall the progress of closing jails, reduce the island's population, and transfer land out of the DOC's control. In January 2022, the Adams administration missed its first land transfer deadline that was mandated by the Renewable Rikers. The administration failed to transfer any land on the island from the DOC to DCAS for the duration of his term. The Adams administration also supervised the gradual increase of detainees from approximately 5,700 at the beginning of his term up to around 7,000 toward the end of 2025¹, and even opened the island to potential U.S. Immigration and Customs Enforcement (ICE) operations in cooperation with the Federal administration. Mayor Adams failed to convene the Rikers Island Advisory Committee, waiting until 2023 to do so for the first time and only convening it four times total. In 2025, the Adams administration was found to be out of compliance with the standing Nunez consent decree, and jails on the island were placed under Federal receivership, to have portions of their operations overseen by an appointed manager until certain conditions improved.

In early 2024, the City released two feasibility studies exploring the potential of [renewable energy generation and storage](#) and [wastewater treatment](#) mandated by Local Law 17 of 2021 and Local Law 31 of 2021, respectively, as sustainable uses for Rikers Island. Given the broad political hostility to the vision of Renewable Rikers, NYC-EJA sought expertise to critically analyze the feasibility studies to understand their underlying

1. Blau, Reuven. "City Jail Population Surpasses 7,000, Headed in Wrong Direction for Close-Rikers Plan"

TIMELINE OF KEY EVENTS

2019

The City passed into law a plan for the closure of all jail facilities on Rikers Island by 2027

Coalition co-founded by Freedom Agenda, NYC-EJA, and other key partners

Renewable Rikers Act introduced by then-Council Member Costa Constantinides

2020

Campaign hosts series of town halls across the five boroughs to determine what a community-led vision for a post-carceral island

2021

New York City Council passes the Renewable Rikers Act

Under the De Blasio administration, in July 2021 and December 2021 land transferred from the Department of Correction (DOC) to the Department of Citywide Administrative Services (DCAS)

2022

Eric Adams takes office as mayor of New York City

First and second land transfer deadlines under the Adams administration pass with no action

2023

Rikers Island Advisory Committee convenes for the first time

2024

Renewable Rikers Act-mandated feasibility studies on the renewable energy potential and wastewater treatment capacity on Rikers published by the City

Master plan legislation ([Int 1038-2024](#)) introduced by Council Member Sandy Nurse to mandate a master planning process for the future of Rikers Island

2025

Alternative plans floated by some Mayoral candidates during primaries to continue operation of jails on Rikers Island and cancel borough-based jail construction

During his tenure, Mayor Adams misses every single deadline to transfer land from the control of DOC to DCAS

assumptions and priorities and, by extension, the view of the project by the City's leadership. While the studies on renewable energy and wastewater treatment supported the general vision of Renewable Rikers and its benefits overall, NYC-EJA was left with key questions on the implementation of such a large-scale project and effects of its completion on surrounding communities and the city as a whole, especially given current conditions.

Key assumptions from the City's feasibility studies that we wanted to analyze further:

Timeline

The city's wastewater feasibility study illustrates a full build-out timeline of 40 years for the new WRRF. While we understand that infrastructure of this magnitude can take decades to build out, we ask whether this is justified and whether it is possible to shorten this timeframe.

Capacity

The city's wastewater feasibility study quotes a capacity for a new wastewater resource recovery facility on Rikers Island at 705 million gallons per day. We ask whether this is a fair consideration for a modern facility and reasonable, given the increase of combined sewer overflow scenarios due to more frequent cloudburst incidents. Similarly, with regard to the City's Energy study, we ask the research team to look deeper into the renewable energy generation and storage potential.

Local Impacts

NYC-EJA views Renewable Rikers as part of an ongoing commitment by the City to undo the work of siting polluting infrastructure in low-income communities of color and returning land to be used for public benefit. Part of this commitment includes the closure of key peaker plants in Queens and South Bronx. Similarly, we hope to investigate the potential of diminishing the operating footprint of the four WRRFs that the new plant will replace, and the potential to use the land for green space.

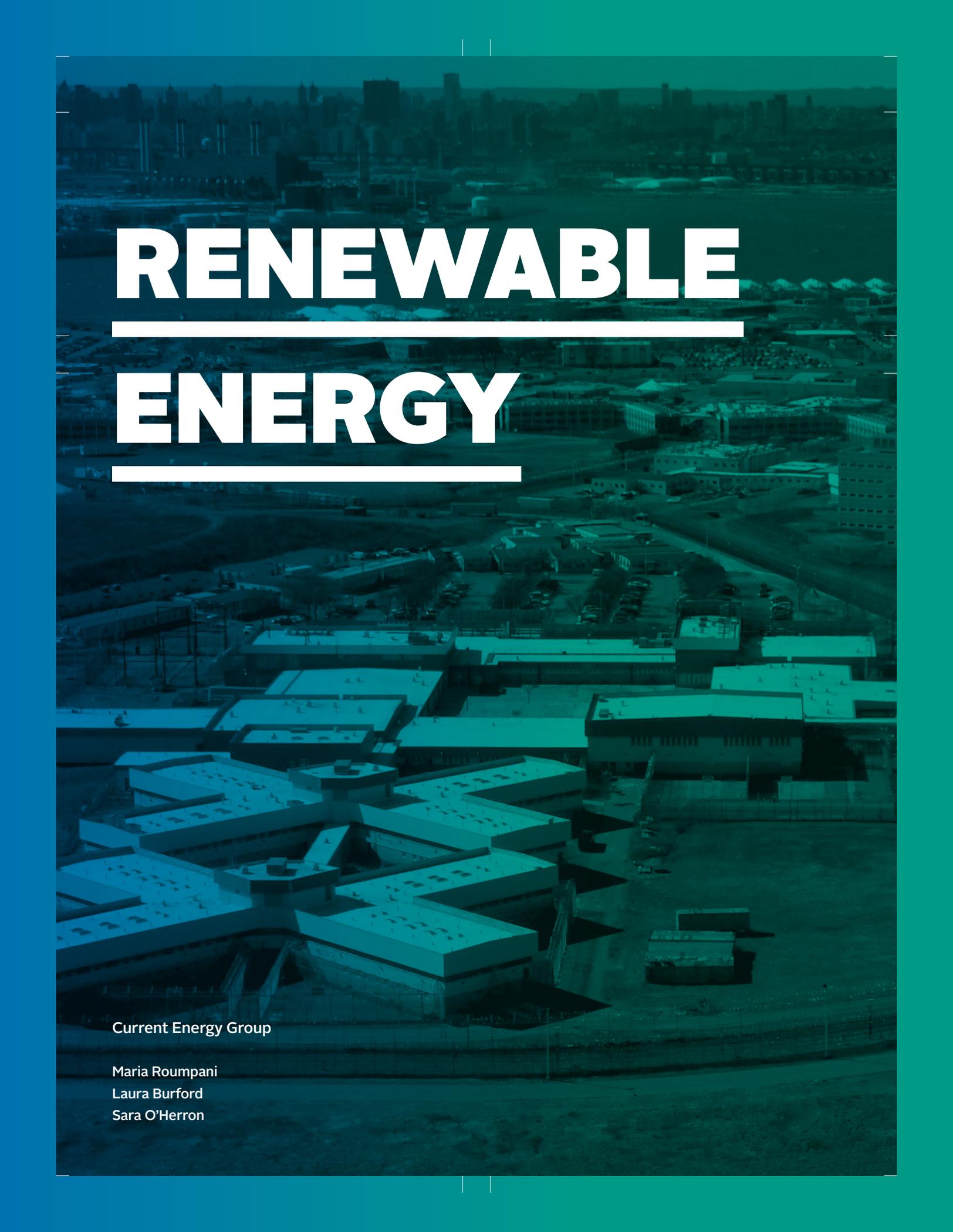
RESEARCH TEAMS

NYC-EJA worked with two separate teams to undertake the analysis of the City's renewable energy and wastewater treatment feasibility studies. The Current Energy Group reviewed the City's renewable energy feasibility study, and Dr. Shannon Marquez examined the wastewater treatment feasibility study. Below are brief descriptions of the consultants and their backgrounds:

[Current Energy Group \(CEG\)](#) offers a fresh perspective to clients, bringing a comprehensive approach to the energy transition. By addressing the technical, economic, and policy questions at the heart of every decision, CEG helps clients achieve outcomes that are engineered to be actionable, financially viable, and beneficial for the communities served.

[Dr. Shannon Marquez](#) is the Dean of Undergraduate Global Engagement and Director of the Columbia University Center of Undergraduate Engagement (UGE). UGE enhances access and support for undergraduates to have global opportunities and brings students and faculty together in a central location that creates a hub of global activity at Columbia. It allows students to better connect and learn about potential programs; encourages faculty and staff to share their global and regional expertise and advice; and facilitates the collaborative development, implementation, and assessment of new and existing global programs and opportunities for global engagement across Columbia and around the world.

This report follows an anthology structure, providing the analysis undertaken by each research team/consultant in separate chapters. The two main chapters function as independent analysis from both a renewable energy and wastewater treatment perspective, coming together to present a broader understanding of the possibilities for Rikers Island. Although they can be read independently, together they present a holistic analysis of the pathways available to achieve the Renewable Rikers vision.



RENEWABLE ENERGY

Current Energy Group

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ABOUT CURRENT ENERGY GROUP

Current Energy Group offers clients a fresh perspective, bringing a comprehensive, interdisciplinary approach to the energy transition. By addressing the technical, economic, and policy questions at the heart of every decision, we help our clients achieve outcomes that are actionable, financially viable, and beneficial for the communities we serve.

Our nationally recognized experts provide objective insights backed by rigorous analysis to solve complex challenges across a broad range of topics, including advanced rate design, cost of service, DER integration, energy system decarbonization, gas transition, power system planning, and regulatory and policy innovation. Our team brings deep expertise to deliver proven solutions that balance sustainability, affordability, and reliability—creating meaningful impact to help shape the future of energy systems.

We serve both private- and public-sector entities, such as Fortune 500 companies, state agencies, public interest organizations, utility commissions, clean energy buyers, industry trade associations, and consumer advocates. For more information, visit currentenergy.group.

ACKNOWLEDGEMENTS

Current Energy Group is grateful for the valuable insights and feedback provided by the stakeholders in this project, including the following staff from the New York City Environmental Justice Alliance (NYC-EJA): Eddie Bautista, Shravanthi Kanekal, Michael Higgins Jr, Eunice Ko, and Daniel Chu.

Founded in 1991, NYC-EJA is a non-profit, 501(c)3 citywide membership network linking grassroots organizations from low-income neighborhoods and communities of color in their struggle for environmental justice.

More information about NYC-EJA is available at nyc-eja.org/.

DISCLAIMER

This report was prepared by Current Energy Group for New York City Environmental Justice Alliance. It is intended to be read and used as a whole and not in parts. The report reflects the analyses and opinions of the authors using currently available information and does not necessarily reflect those of New York City Environmental Justice Alliance.

EXECUTIVE SUMMARY

New York City’s Renewable Rikers initiative represents a once-in-a-generation opportunity to transform the jail complex into one of the most consequential clean energy assets in the state. Building on the 2024 Renewable Rikers Feasibility Study completed by the National Renewable Energy Laboratory and the 2024 Wastewater Resource Recovery Facility (WRRF) Study by the NYC Department of Environmental Protection, this expanded analysis incorporates additional metrics and updated information to allow for earlier deployment and a larger buildout of clean energy resources through a phased approach.

Using an optimization model that incorporates recent technology costs, land constraints, and market price forecasts, this study analyzes the planning feasibility and impacts of two major development phases for Renewable Rikers. Phase I offers near-term solar and storage prior to WRRF construction and offshore wind connection, while Phase II demonstrates the full long-term buildout, integrating offshore wind and the WRRF. The results are illustrative of the magnitude of the possible buildout and the economic selections of resources. Offshore wind connections are critical to unlocking gigawatts of clean energy that can be delivered through Rikers Island. While Phase I provides early value, Phase II unlocks transformative levels of clean generation, social benefits, and fossil-fuel displacement—providing market revenue in the form of generation, capacity, and renewable energy credits. Further, the project’s capital, operation, and maintenance expenditures will create economic contributions in the form of jobs, labor income, and economic activity which will bolster New York’s clean energy economy.

A PHASED STRATEGY FOR CLEAN ENERGY AT RIKERS ISLAND

	PHASE I	PHASE II
Offshore Wind	-	6,000 MW
Solar	26 MW	33 MW
Energy Storage	Up to 3,582 MW	1,685 MW

PROJECTED ANNUAL IMPACTS OF RENEWABLE RIKERS PORTFOLIOS

	MARKET REVENUES	AVOIDED FOSSIL FUEL GENERATION	AVOIDED COST OF CARBON	AVOIDED HEALTH COSTS
Phase I	\$605.2 million	49.3 GWh	Up to \$5.2 million	Up to \$2.5 million
Phase II	\$3.143 billion	18,431.7 GWh	Up to \$1.7 billion	Up to \$943.0 million

BOTTOM LINE

Renewable Rikers stands as one of the most powerful tools New York City has to accelerate decarbonization, retire fossil-fuel peaker plants, and improve public health. With intentional planning and strategic coordination across agencies and initiatives, Renewable Rikers can become a defining achievement in New York's clean energy transition—turning a symbol of inequity into a landmark of climate progress and environmental justice.

INTRODUCTION

New York City's *Renewable Rikers Act* of 2019 created the framework to advance city and state climate goals through a reenvisioned Rikers Island. The jails on Rikers Island are mandated to close in 2027, after which the island will undergo a transformation into a clean energy hub, known as **Renewable Rikers**.

In February 2024 the NYC Mayor's Office of Climate & Environmental Justice released the *Renewable Rikers Feasibility Study Report* that contained results of analysis completed by the National Renewable Energy Laboratory (NREL).² The **NREL Study** identified initial constraints and assumptions about the type and magnitude of renewable energy resources that could be part of the Renewable Rikers portfolio and calculated the economic impacts of the various portfolios. In addition to renewable energy resources, the NREL Study also considered incorporating a Wastewater Resource Recovery Facility (WRRF) on Rikers Island for one of the five evaluated scenarios. A subsequent **WRRF Study** evaluating the feasibility of a WRRF on Rikers Island was completed in March 2024 by the NYC Department of Environmental Protection (DEP).³

The ***purpose of this report*** is to build upon the prior studies, as well as previous work by the PEAK Coalition,⁴ to enhance and expand the planning for clean energy resources at Rikers Island. Towards that aim, this analysis applies a phased approach with new technologies that allow for earlier deployment and a larger buildout of clean energy resources. The analysis also incorporates additional metrics and updated information, including quantifying the value of reduced fossil fuel consumption and progress towards city and state emission reduction goals. The impact of different assumptions is evaluated through scenario analysis. To further progress towards developing Renewable Rikers, this report concludes by identifying subjects for further analysis and recommendations to turn the vision of Renewable Rikers into reality.

NREL FEASIBILITY STUDY SUMMARY

The NREL Study evaluates five scenarios for redeveloping Rikers Island into a clean energy hub using methodologies grounded in Geographic Information System (GIS) analysis, energy resource modeling, and economic impact assessments. The study assumes a constrained buildable footprint

2. National Renewable Energy Laboratory. (2024, February). Renewable Rikers Feasibility Study Report. NYC Mayor's Office of Climate & Environmental Justice. <https://www.nyc.gov/content/climate/pages/reports-and-publications/renewable-rikers-feasibility-study-report>.
3. Department of Environmental Protection, New York City. (2024, March). Feasibility Study for a New Wastewater Resource Recovery Facility on Rikers Island. <https://www.nyc.gov/assets/dep/downloads/pdf/about/rikers-island-wrrf-feasibility-study-march-2024.pdf>.

4. The PEAK Coalition is comprised of UPROSE, THE POINT CDC, New York City Environmental Justice Alliance, New York Lawyers for the Public Interest, and Clean Energy Group who are working to replace polluting power plants in New York City environmental justice communities. More information about PEAK is available at <https://www.peakcoalition.org/>.

of 343 acres due to flood risk and elevation, and limits energy exports to 3,500 MW based on the hosting capacity of two existing substations (Astoria and Mott Haven) and does not allow for imports from the grid to charge storage resources.

TABLE 1. SCENARIOS EVALUATED IN THE NREL FEASIBILITY STUDY

	TECHNOLOGY COMBINATION	NOTE
1	Solar: 110 MW, Battery Storage: 431 MW	No OSW Converter
2	Solar: 104 MW, Battery Storage: 120 MW, OSW Converter: 4,000 MW	Adds OSW Converter
3	Solar: 92 MW, Battery Storage: 840 MW, OSW Converter: 6,000 MW	Larger OSW Converter & Storage
4	Solar: 70 MW, Battery Storage: 1,600 MW, OSW Converter: 12,000 MW	Largest OSW Converter & Storage (violates NREL transmission limitations)
5	Solar: 9 MW, Battery Storage: 849 MW, OSW Converter: 6,000 MW + WRRF	Only scenario with WRRF

Technologies like tidal, hydrogen, and onshore wind are excluded from consideration due to lack of commercial maturity, site instability, and height restrictions near LaGuardia Airport. The scenarios incorporate combinations of solar photovoltaic systems, 4-hour battery storage, offshore wind (OSW) converters, and the WRRF, with system sizes determined by land availability and grid constraints. Table 1 summarizes each of the five scenarios.

Among the five scenarios evaluated in the NREL Study, Scenario 5 is identified as the most comprehensive and aligned with long-term city goals. Scenario 1 is the only scenario that does not incorporate the OSW converter, relying only on solar and storage. The other four scenarios allow for larger deployment of clean energy by incorporating the OSW converter and scalable storage. The NREL Study characterizes Scenario 4 as not viable under current transmission limitations.⁵ While Scenario 5 is the only scenario that incorporates the WRRF, it does not include any energy generation within the WRRF footprint and thus results in lower solar deployment than Scenario 3.

5. The NREL feasibility study evaluated existing and planned hosting capacity and found that the total available interconnection capacity would be 3,500 MW at two existing transmission substations, Astoria in Queens and Mott Haven in the Bronx.

FIGURE 1. COMPARISON OF EXISTING LAYOUT & PLANNED WRRF ON RIKERS ISLAND

Source: (Left) NYC Environmental Protection, NREL Feasibility Study website, <https://www.nyc.gov/site/dep/news/020222/rikers-island-feasibility-study>. (Right) WRRF Feasibility Study, page 28 (edited to remove text boxes).

WRRF STUDY SUMMARY

The WRRF Study evaluates the feasibility of siting a new WRRF on Rikers Island that would consolidate the capacity of the four aging WRRFs⁶ into a single, state-of-the-art facility, while making progress towards eliminating NYC's combined sewer overflows. DEP plans for the existing WRRFs to continue to operate to provide supplemental services. Building the WRRF on Rikers Island offers significant advantages because of the ample space, isolation away from residents and businesses, and access to onsite renewable energy.

The implementation timeline for the Rikers WRRF spans decades, with planning and design beginning in 2025, construction starting in 2035, initial operations by 2045, and full system integration by 2060. DEP estimates the cost of the WRRF facility and associated infrastructure as \$34 billion.⁷

The footprint of the facility would require 245 acres (60%) of Rikers Island. Once fully constructed, the WRRF is expected to consume

approximately 214,700 MWh of electricity per year⁸ and process an average of 705 million gallons a day (MGD) of wastewater (with a maximum capacity of 1,410 MGD). A conceptual rendering of Rikers Island with the WRRF (right panel) and the layout today with the jail (left panel) is provided in Figure 1.

6. The four existing WRRFs are Hunts Point, Tallman Island, Bowery Bay, and Wards Island. DEP does not plan to close the existing WRRFs when the Rikers Island WRRF is built, the plants would remain open to provide supplemental capacity and services.

7. 2024 Dollars, WRRF Study, page 27.

8. NREL Study, page 35.

BACKGROUND AND CONTEXT

Despite large amounts of renewable resources located upstate, almost 90% of energy generated in NYC is from fossil fuels.⁹ While the state has made progress on eliminating coal (with the last plant closing in 2020),¹⁰ NYC remains electrified by fossil fuel resources due to transmission limits and other geographic constraints.

NEW YORK'S CLEAN ENERGY FUTURE

The transition to clean energy is underway throughout New York State, which has one of the most ambitious greenhouse gas emission reduction requirements in the country. New York's 2019 Climate Leadership and Community Protection Act (CLCPA)¹¹ mandates 70% of the electricity used in the state to come from renewable resources by 2030, increasing to a 100% zero-emission electricity by 2040. CLCPA also requires the state to install 3,000 MW of energy storage by 2030 and 9,000 MW of offshore wind by 2035. Figure 2 provides a graphical timeline and summary of CLCPA mandates.

New York City has its own climate goals, including mayoral commitments of 100% clean energy for

government operations by 2026, 500 MW of energy storage citywide by 2025, and 1,000 MW of solar installed citywide by 2030.¹² City-owned property has its own mandates for solar buildouts, with 100 MW required by 2030 and a total of 150 MW required by 2035.¹³

Con Edison, the primary electric provider in NYC, plans to comply with CLCPA in part through new utility-scale renewable generation (including 6,000 MW of offshore wind) as well as transmission upgrades, energy efficiency improvements, and distributed renewable resource generation and storage.

Figure 3 shows the most recent System Resource Outlook from the New York Independent System Operator (NYISO), which details historical and projected annual generation by resource type, statewide through 2042. Although the resource mixes vary, the three scenarios are consistent in having increased generation needs and elimination of fossil fuels by 2040, reliant upon 20 to 40 GW additions of dispatchable-emissions free resources (DEFER) in addition to specified renewable resources, including 9 GW of offshore wind.

9. New York State Energy Research and Development Authority. (No Date). Tier 4 – New York City renewable energy. NYSERDA. <https://www.nyserdera.ny.gov/All-Programs/Large-Scale-Renewables/Tier-Four>.

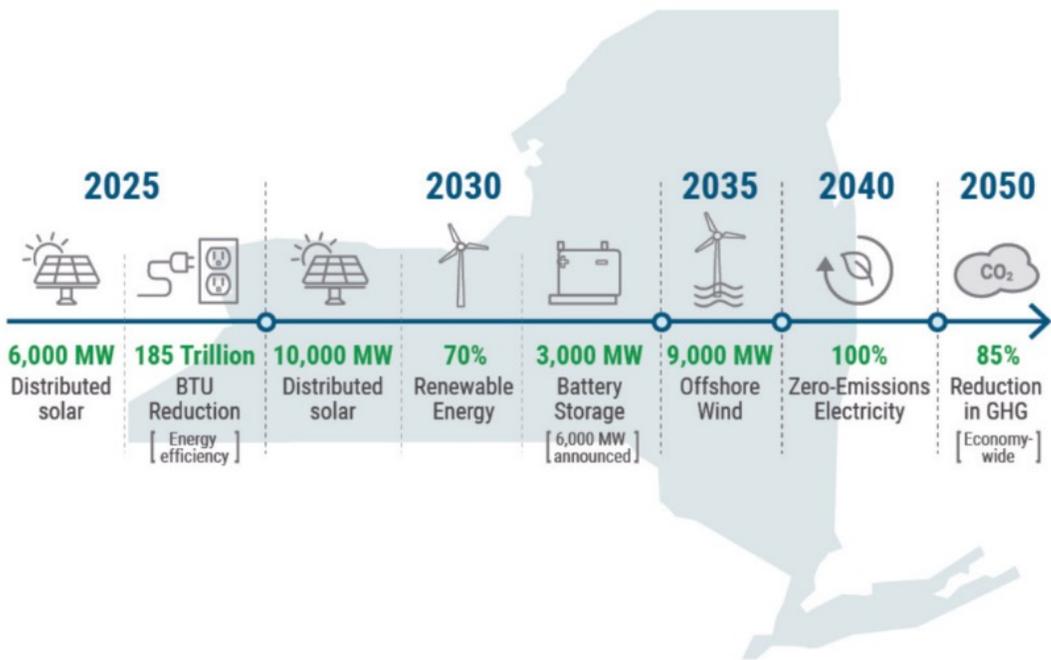
10. Prohaska, Thomas J. (2020, March 30). "New York's last coal-burning power plant closes on Lake Ontario shore." The Buffalo News.

11. For more information on the CLCPA, see: <https://climate.ny.gov>.

12. NYC Mayor's Office of Climate and Environmental Justice website, Energy Infrastructure: <https://www.nyc.gov/content/climate/pages/energy-infrastructure>.

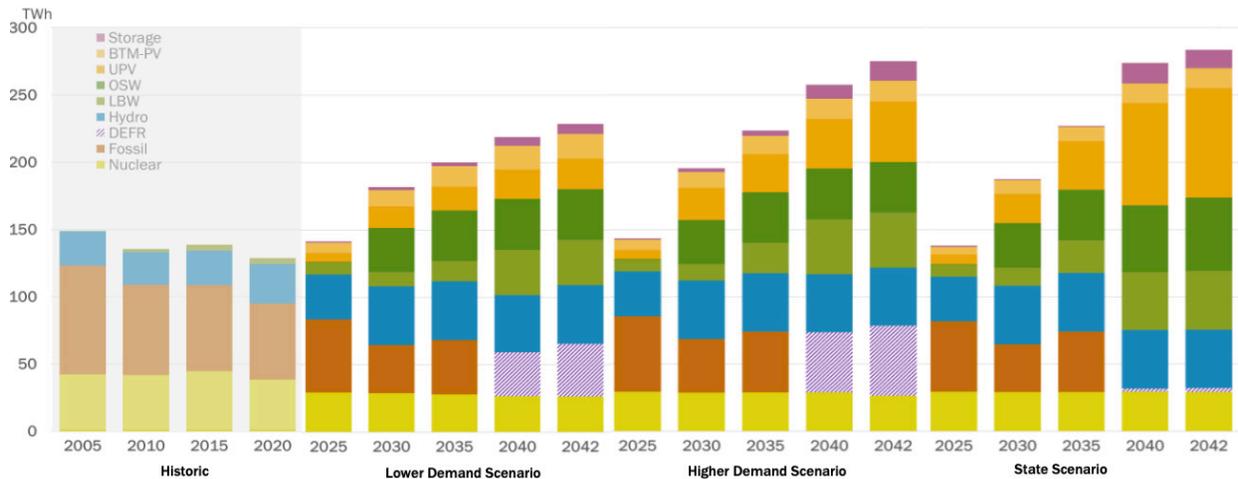
13. Local Laws for the City of New York for the Year 2024, No. 99. <https://intro.nyc/local-laws/2024-99>.

FIGURE 2. NEW YORK STATE ENERGY TRANSFORMATION TIMELINE



Source: New York Independent System Operator website, Public Policies and the Transformation of NY's Electric Grid. <https://www.nyiso.com/-/public-policies-and-the-transformation-of-new-york-s-electric-grid>

FIGURE 3. NYISO SYSTEM RESOURCE OUTLOOK—ANNUAL GENERATION BY POLICY CASE SCENARIO



Source: New York Independent System Operator. (2024, July 23). 2023-2042 System & Resource Outlook. <https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf>.

NOTE: "BTM-PV" is behind-the-meter solar, "UPV" is utility-scale solar, "OSW" is offshore wind, "LBW" is land-based wind, and "DEFR" is dispatchable-emissions free resources.

The System Resource Outlook highlights the importance of Renewable Rikers and additional offshore wind beyond what is currently in the planning queue to decarbonize the New York grid. Even with 9 GW of offshore wind by 2035 (the CLCPA mandate) the grid is reliant on fossil fuels until more, currently unspecified, resources can be added.

EXISTING NYC FOSSIL FUEL GENERATION

Across the five-county area comprising NYC, there are 26 fossil fuel plants that run on natural gas or oil. Together, these plants have a combined nameplate capacity of 8.6 GW and generated 29.0 million MWh in the year 2024. Table 2 provides a list of each plant and their characteristics.

Of particular concern among these generators are the “peaker” plants – the least efficient, highest polluting power plants that generate during “peak” times of high demand on the system. These include all the “gas turbine” plants, which are designed to quickly ramp up or down as needs arise.¹⁴ Because the peaker plants run infrequently, with some only being used as backup power generation, they have the lowest capacity factors,¹⁵ with all operating less than 20% of the time.

The peaker plants, as well as some of the combined cycle and steam turbine plants, have planned retirements in the next five years. New York Power Authority (NYPA) owned plants¹⁶ are expected to retire by 2030 as required by the 2023-24 Enacted State Budget.¹⁷ Other plants

are retiring due to a combination of the 2019 “Peaker Rule”,¹⁸ CLCPA decarbonization goals, and economics.

Despite state goals to close the fossil fuel plants, there have recently been delays of planned retirements, Gowanus 2 & 3 and Narrows 1&2—combined capacity of 565 MW and owned by Astoria Generating Company (parent company ArcLight Capital Holdings LLC)—were designated to retire in May 2025, but their retirements were extended due to concerns about available replacement capacity.¹⁹ While expected to retire after completion of a new high-voltage transmission line, these delays underscore the need for solutions like Renewable Rikers to meet the 2030 and 2040 CLCPA mandates. (Table 2)

Peaker plants run on various types of fuels, including natural gas and fuel oil, which releases carbon dioxide (CO₂).²⁰ Despite their low utilization levels, peaker plants require a relatively larger amount of fuel and, as a result, generate the highest levels of greenhouse gas emissions per MWh (0.546 tons CO₂/MWh). In comparison, all utility-provided electricity in NYC had an emissions intensity of 0.289 tons CO₂ per MWh in 2024.²¹ Table 3 summarizes emission levels for each type of fossil fuel plant. The majority (74%) of the 11.7 million tons of CO₂ in 2024 from fossil fuel plants in NYC were emitted by combined cycle plants.

14. While the “gas turbine” plants primarily use natural gas, some also use fuel-oil as a secondary fuel (e.g. Narrows Generating Station and Gowanus Gas Turbines).
15. The annual capacity factor represents the ratio of actual generation over a year compared to the maximum potential generation if the generator was running continuously.
16. Harlem River, Hell Gate, Kent, Joseph J. Seymour, Pouch, and Vernon Boulevard are NYPA plants.
17. NYPA website, Small Natural Gas Power Plants: <https://nypa.gov/small-natural-gas-power-plants>.

18. In 2019, the New York State Department of Environmental Conservation adopted a regulation to limit nitrogen oxides (NOx) emissions from simple-cycle combustion turbines, referred to as the “Peaker Rule”, which went into effect in May 2023.
19. New York Independent System Operator. (2023, November 20). Short-Term Reliability Process Report: 2025 Near-Term Reliability Need. <https://www.nyiso.com/documents/20142/39103148/2023-Q2-Short-Term-Reliability-Process-Report.pdf>.
20. In addition to CO₂ emissions, extraction and transportation of natural gas and fuel oil also release methane and other emissions, which have additional contributions to air pollution and climate change.
21. New York City Department of Building Rules. (2022, October 11). *Section 103-14 of Chapter 100 of Title 1 of the Rules of the City of New York*.

TABLE 2. NEW YORK CITY FOSSIL FUEL POWER PLANTS

TECHNOLOGY TYPE	POWER PLANT NAME	NUMBER OF UNITS	NAMEPLATE CAPACITY (MW)	GENERATION (MWH, 2024)	CAPACITY FACTOR (2024)
COMBINED CYCLE	Astoria Energy Facility	3	595	5,897,563	80%
	Astoria Energy II (AE2)	3	650	5,711,154	70%
	Eugene W. Zeltmann Power Project	3	528	5,087,488	80%
	East River Repowering	2	360	2,258,547	72%
	Brooklyn Navy Yard Cogeneration	4	322	2,224,656	77%
	Ravenswood CC	2	269	1,955,085	81%
	Kennedy International Airport Cogen	3	121	455,136	43%
	Riverbay CC	3	42	26,084	7%
Combined Cycle Total		23	2,887	23,615,713	74%
GAS TURBINE	Vernon Boulevard	2	94	126,300	15%
	Harlem River Yards	2	94	118,846	14%
	Hell Gate	2	94	114,050	14%
	Joseph J. Seymour Power Project	2	94	109,390	13%
	Pouch Terminal	1	47	81,791	20%
	North 1st and Grand (Kent)	1	47	72,651	18%
	Bayswater Peaking Facility	1	61	47,689	9%
	Narrows Generating Station	16	352	39,707	1%
	Jamaica Bay	1	61	26,191	5%
	Gowanus Gas Turbines Station	16	320	11,379	0%
	Astoria Generating Station CT	1	15	633	0%
	Arthur Kill CT	1	18	415	0%
	59th Street CT	1	17	406	0%
	74th Street CT	2	37	28	0%
Gas Turbine Total		49	1,350	749,476	6%
STEAM TURBINE	Astoria Generating Station	4	1,330	1,847,266	16%
	Arthur Kill	2	878	1,352,985	17%
	East River	2	356	744,950	24%
	Ravenswood	3	1,827	708,268	4%
Steam Turbine Total		11	4,391	4,653,469	12%
Grand Total		83	8,627	29,018,658	32%

Source: Created by CEG with information from S&P Insights.

Note: "Generation" refers to gross generation (rather than net). Capacity factors are calculated based on net generation (where data is available, else gross generation). Two gas turbine power plants located in the Rockaway Peninsula, Jamaica Bay and Bayswater, are physically located in NYC (Queens) but are connected to Long Island (Zone K), not in NYC (Zone J).

TABLE 3. ANNUAL CARBON EMISSIONS FROM NYC FOSSIL FUEL PLANTS (2024)

TECHNOLOGY	CO2 EMISSIONS (TONS)	GROSS GENERATION (MWH)	INTENSITY (TONS CO2/ MWH)
Combined Cycle	8,727,428	23,615,713	0.370
Steam Turbine (Peaker Plants)	2,540,874	4,653,469	0.546
Gas Turbine	469,348	749,476	0.626
Total	11,737,650	29,018,658	0.404

Source: Calculated by CEG with plant-level emission data from S&P Insights.

Because carbon dioxide emissions impose significant economic, environmental, and public health damages that are not reflected in market prices, policymakers use the *social cost of carbon* to capture the cost of these emissions to society. New York State uses a damages-based value of carbon that is based upon the 2023 U.S. Environmental Protection Agency social cost of greenhouse gases value (under varying discount rate assumptions). Using the recommended 2% discount rate, this report utilizes the central value \$241 per metric ton of CO₂ emissions^{22,23}.

Table 4 presents estimated annual social costs of carbon emissions from New York City's fossil fuel plants between 2020 and 2024. Over this period, both emissions and associated costs have declined as several peaker plants have reduced operations or retired entirely, resulting in a 22% decrease in CO₂ emissions.

Generation from the existing fossil fuel plants in NYC is associated with emissions of nitrogen oxides (NO_x), sulfur oxides (SO_x), and fine particulate matter (PM_{2.5}). NO_x contributes to the formation of ground-level ozone and smog, worsening respiratory conditions such as asthma.

TABLE 4. ANNUAL CO2 EMISSIONS AND COSTS FROM NYC FOSSIL FUEL PLANTS

	CO2 EMISSIONS (TONS)	SOCIAL COST OF CO2 EMISSIONS (\$)
2020	11,737,650	\$2.83 billion
2021	11,387,776	\$2.74 billion
2022	10,593,810	\$2.55 billion
2023	9,826,658	\$2.37 billion
2024	9,592,295	\$2.31 billion

Source: Created by CEG with emission data from S&P Insights. Note: All values are in real 2025 dollars.

SO_x can combine with other compounds in the atmosphere to form fine particles that impair lung function and increase the risk of cardiovascular disease. PM_{2.5}, which consists of particles small enough to penetrate deep into the lungs, is linked to elevated risks of premature mortality and other serious health impacts.

Because fossil fuel plants are often located near dense, lower-income residential areas and operate on the hottest days when air quality is already poor, their emissions disproportionately affect

22. New York State, Department of Environmental Conservation. (2025, April). *Establishing a Value of Carbon: Guidelines for State Agencies*. Page 5. <https://dec.ny.gov/sites/default/files/2025-04/vocguide2025.pdf>.

23. \$241/metric ton is calculated by converting \$193/metric ton in 2020 dollars to 2025 dollars.

health outcomes for vulnerable communities in NYC.²⁴ Table 5 provides the 2024 levels of pollution from fossil fuel generators in NYC. PM_{2.5} is particularly costly, reflecting the widespread health impacts from the small particles.

TABLE 5. ANNUAL AIR POLLUTION EMISSIONS & HEALTH COSTS (2024)

	ANNUAL AIR POLLUTION EMISSIONS (TONS)	ESTIMATED ANNUAL HEALTH COSTS (\$)
PM_{2.5}	1,028	\$1,417 million
SOx	224	\$26 million
NOx	2,260	\$85 million
Total	3,512	\$1.529 billion

Source: Created by CEG with emission data from S&P Insights. Note: All values are in real 2025 dollars.

NYC DECARBONIZATION PROJECTS

Renewable Rikers has the potential to reduce NYC’s historical reliance on fossil fuels and replace them with clean energy. In addition to Renewable Rikers, other large-scale projects that will propel progress towards decarbonization include:

Brooklyn Clean Energy Hub

Located at the site of the former Hudson Avenue fossil fuel plant, the Brooklyn Clean Energy Hub is a critical part of ConEdison’s roadmap to meet CLPCA decarbonization mandates. The Hub will be an interconnection point for 1,500 MW of offshore wind (expandable to 6,000 MW). The cost of the transmission substation project is \$810 million, and it is expected to be completed in 2028.²⁵

24. PEAK Coalition. (2024, January). *Accelerate Now! The Fossil Fuel End Game 2.0*. <https://www.peakcoalition.org/reports/accelerate-now>.

25. ConEdison website, *Brooklyn Clean Energy Hub*: <https://www.coned.com/en/our-energy-future/our-energy-vision/where-we-are-going/were-ready-for-offshore-wind>.

Champlain Hudson Power Express (CHPE)

Running underground and underwater from the Province of Québec in Canada to the Astoria Energy Complex in Queens, the 1,250 MW High Voltage Direct Current (HVDC) transmission line began in November 2022 and is slated for completion by Spring 2026. The project is set to deliver approximately 10.4 terawatt-hours of clean energy annually to the New York metropolitan area, reducing an estimated 37 million metric tons of carbon emissions by 2040. CHPE is projected to stimulate \$3.4 billion in economic investments across upstate and downstate communities and create more than 1,400 family-sustaining jobs statewide.²⁶

Renewable Ravenswood

Rise Light & Power’s has a long-term plan to convert the fossil fuels at Ravenswood Generating Station in Queens into a Renewable Energy Hub with offshore wind connection, battery storage, and an upstate transmission line.

Clean Path

A proposed 175-mile transmission project to deliver clean power from Upstate New York into New York City.

Many of the large-scale initiatives for clean renewable energy to replace fossil fuels are reliant on future offshore wind. Table 6 provides a summary of planned offshore wind projects that are anticipated to serve New York State. Of these, two projects have planned interconnection in NYC (Empire Wind 1 and Beacon Wind). The two other projects—Empire Wind 2 and Excelsior Wind—have not yet begun construction but could be potential connections for Renewable Rikers or other NYC clean energy hubs. Recent economic and political headwinds for the offshore wind industry since 2024 have created additional uncertainty about the timing of the unfinished projects.

26. NYSERA website, *Tier 4 New York City Renewable Energy*: <https://www.nyseda.ny.gov/All-Programs/Large-Scale-Renewables/Tier-Four>.

TABLE 6. OFFSHORE WIND PROJECTS IN NEW YORK STATE

PROJECT NAME	DEVELOPER	CAPACITY (MW)	STATUS
South Fork Wind	Ørsted	132	Operational as of 2024 with interconnection in Long Island
Sunrise Wind	Ørsted	924	Under construction – operational by end of 2027 with interconnection in Long Island
Empire Wind 1	Equinor	810	Under construction – operational by end of 2027 with interconnection at Gowanus
Beacon Wind	BP	1,230	Pending – planned interconnection at Astoria substation
Empire Wind 2	Equinor	1,260	Pending – construction not started
Excelsior Wind	Vineyard Offshore (CIP)	1,350	Pending – construction not started
Total		5,574	

Source: Created by CEG using publicly available information.

ANALYSIS AND RESULTS

APPROACH

The purpose of this analysis is to explore the potential for clean energy at Renewable Rikers to help decarbonize the NYC grid. To that end, the approach for this analysis begins with the prior analyses from the NREL Study and WRRF Study as the foundation, building upon them with updated and additional information.

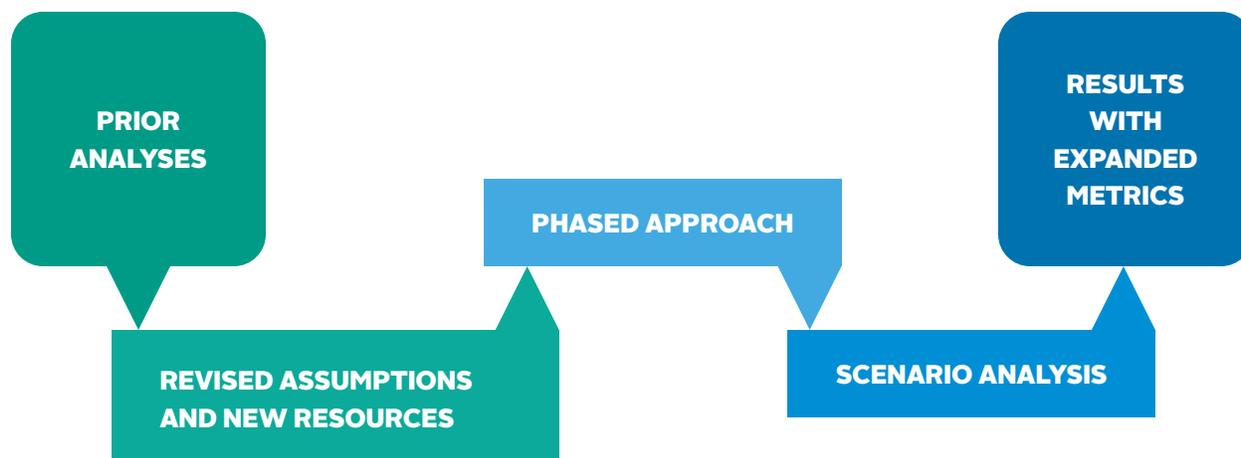
First, the analysis incorporates revised assumptions and new resources with likely development timelines to identify opportunities for a phased approach. To better understand the value that different resources sited on Rikers Island can deliver to the NYC grid under varying input levels and assumptions, we use a custom optimization model to create clean resource portfolios. The mathematical model maximizes an objective

quantifying the Renewable Rikers energy, capacity, and decarbonization values subject to land and transmission constraints. Scenario sensitivity analyses demonstrate the impact of assumption modifications on the results, which include expanded metrics beyond what was evaluated in the NREL Study. Figure 4 provides a flowchart of the analytical approach.

PHASED APPROACH CONSIDERATIONS

As a major infrastructure project in New York City, the timeline for the full buildout of Renewable Rikers will span decades. The WRRF Feasibility report estimated that the connection to the Rikers Island WRRF to the existing facilities would not be completed until 2060, with site construction finished by the end of 2039. Accordingly, this analysis assumes that 2040 is the earliest possible

FIGURE 4. OVERVIEW OF ANALYTICAL APPROACH



time for full implementation of a complete Renewable Rikers. Given this construction timeline, as well as timelines for connections to potential offshore wind project, a phased approach is appropriate to consider two separate clean resource portfolios—one with the WRRF and offshore wind and one without.²⁷

PHASE I

This phase represents an initial clean energy portfolio after demolition and site preparation at Rikers Island, but before the buildout of the WRRF and without any connection to an offshore wind project. The representative year for Phase I is 2030, signifying a time after the closure of Rikers Island Jail in 2028, but before the completion of the WRRF.²⁸ In Phase I, no offshore wind converters are incorporated into Renewable Rikers, the available technologies are only solar

and storage. All buildable areas of the island are available for solar and storage, including on the portion of the island that will be developed into the WRRF for Phase II.

PHASE II

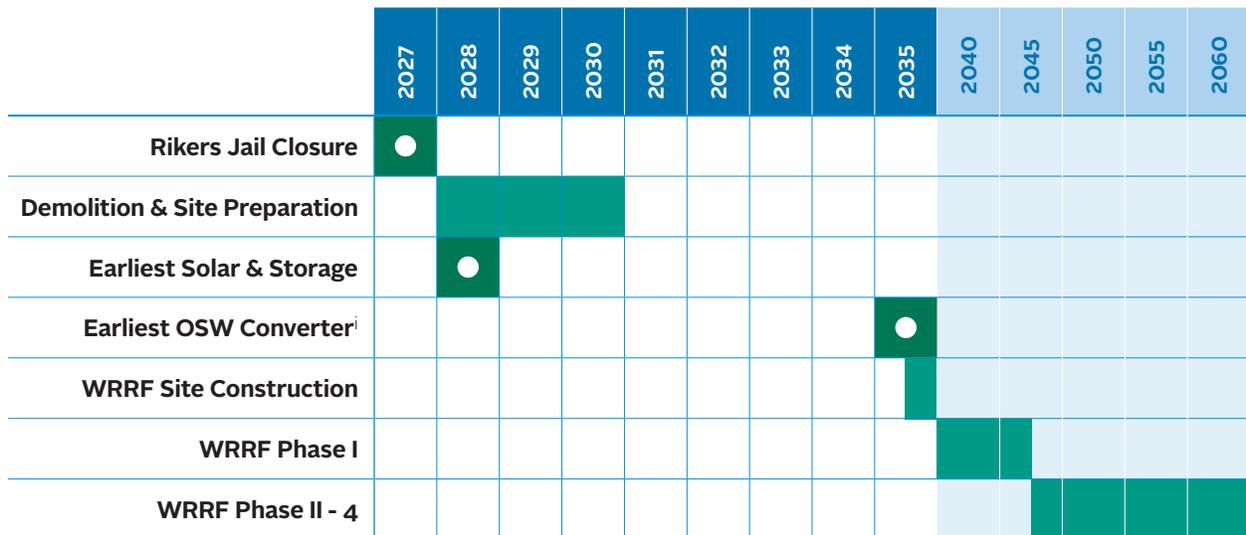
The second phase represents the long-term, full buildout of Renewable Rikers with both the WRRF and offshore wind. The base case for the Phase II analysis uses the same assumptions as Scenario 5 from the NREL Study of 6,000 MW of offshore wind and a 3,500 MW transmission limit. Unlike the NREL Study, Phase II allows solar and storage to be incorporated within the WRRF footprint. The representative year for Phase II is 2040, corresponding to the earliest year that renewables could be incorporated with the WRRF. Figure 5 provides further assumptions about timelines for the various elements of Phase II.

27. The phased approach and timeline differ from the NREL Study, which assumed an installation year of 2027 for all scenarios.
 28. The “representative year” is used for reference only and to have a specific year that costs and values are tied to. It is not meant to imply that any action will occur in any specific year. Exact timing will vary depending on immediate and long-term factors.

OPTIMIZATION MODELING

To identify the appropriate level and mix of renewable resource portfolios given land and transmission constraints, this analysis utilizes an

FIGURE 5. TIMELINE ASSUMPTIONS FOR COMPONENTS OF RENEWABLE RIKERS



Source: Created by CEG with WRRF timeline information from WRRF Feasibility Study, page 43.

i. No specific offshore wind project has been identified for Renewable Rikers. The earliest date assumes that Renewable Rikers connects to a currently unspecified project and that the timeline to full energization is 10 years. Actual timeline may be longer or shorter, depending on the project, as well as regulatory processes and supply chain constraints.

optimization model. The model creates clean energy portfolios by **maximizing the value of Renewable Rikers** on an hourly basis, subject to constraints and model input values. The model's objective function identifies the highest value portfolio from candidate resources based on three value streams: energy, capacity, and environmental attributes.²⁹The model's decision variables reflect investment decisions for solar and storage, including both short duration, and long duration options, as well as dispatch decisions to maximize the value of the energy exported from Rikers Island to the NYC grid. The primary constraints are:

1. Resources physically located on Rikers are subject to buildable land constraints.
2. Energy imported (to charge storage assets) or exported from Rikers Island is subject to an hourly transmission constraint.
3. Renewable resources and energy storage operations are subject to technical constraints (hourly renewable generation profiles, storage dispatch constraints, etc.).

The purpose of the modeling is to better understand the value proposition of each resource relative to its land requirements and cost. The results of this analysis are meant to be illustrative of the scale and magnitude of possible resource portfolios, as well as provide insights regarding the optimal resource mix for Renewable Rikers under different assumptions. Further consideration of practical and site-specific issues—including updated market values, buildable land conditions, equipment and permitting timelines, cost and availability of technologies, and final design of the WRRF—will be necessary prior to finalization of the clean resource portfolio for Renewable Rikers.

To provide additional information about how the composition of the resource mix changes under different possible future conditions, **scenario analysis** creates separate runs of the optimization model that varying input assumptions, including:

- » Ability for storage resources on Rikers Island to be charged by the onshore city grid through bidirectional transmission (“hybridized” charging), up to transmission limit of 3,500 MW.
- » Consideration of capacity prices to maximize the value of capacity resources, which incentivizes storage as a capacity resource.
- » Consideration of renewable energy credit (REC) prices to maximize the value of energy generating resources, which incentivizes solar as a generation resource (offshore wind generation values are fixed).
- » Increases in available land area on the island for clean energy resources.
- » Increase of the transmission limit from 3,500 MW to 5,000 MW (Phase II only).
- » Increase in the offshore wind connection from 6,000 MW to 8,000 MW (Phase II only).

See Appendix for additional information regarding the optimization model inputs.

CANDIDATE RESOURCES

The candidate resources vary between the two phases. Like the NREL Study, the available candidate resources are solar, storage, and offshore wind (excluding other resources such as onshore wind, small modular nuclear reactors, tidal energy, biomass, geothermal, and all non-renewable resources). Unlike the NREL Study, long-duration energy storage (i.e. 100-hour battery storage) is an available candidate resource in both Phase I and Phase II.

Since the publication of the NREL Study in 2024, federal tax credits under the Inflation Reduction Act have changed. The July 2025 H.R.1 federal budget reconciliation bill set earlier expiration dates of July 2026 for wind and solar to be eligible for the previously technology neutral tax credits,

29. Environmental attribute values are estimated using renewable energy credit (REC) prices for New York.

the investment tax credit (ITC) and the production tax credit (PTC). Battery storage resources remain eligible for the full tax credits until 2032, with partial values through 2035.^{30,31}

RESOURCE PORTFOLIOS & GENERATION

The results of the optimization modeling analysis identify the resource mixes for Renewable Rikers that maximize the value of electricity for Phase I and Phase II.³¹ This section contains the results of the resource portfolios and their annual generation for each phase and scenario.

PHASE I

Prior to the development of offshore wind resources and the WRRF, Phase I allows for solar and storage to be located onsite to provide earlier availability of clean energy resources. For this phase, solar, 4-hour storage, and 100-hour storage are available for the model to select. The available acres for Phase I are the same as Phase II for the base case (196 acres). Although the full land available in Phase I is 343 acres, buildout to that extent would result in excessive resources once the WRRF facility is built. As a sensitivity, there is a scenario with the full 343 acres available.

A critical deciding element for Phase I resource selections is whether energy can be imported to Rikers Island to charge battery storage resources. Without hybridized charging from the grid, storage resources are only able to be charged by onsite solar (modeled by the “No Imports” scenarios). Energy storage on Rikers Island can be cost effective even in Phase I because of two potential value streams:

High capacity payments, reflecting a constrained system that needs capacity resources, and/or

30. The NREL Study assumed all renewable resources received the 30% investment tax credit.

31. Full specification of inputs to the optimization model for each scenario are available in the Appendix.

TABLE 7. PHASE I OPTIMIZATION MODEL RESULTS

SCENARIOS	SOLAR (MW)	4-HOUR STORAGE (MW)	LONG DURATION STORAGE (MW)
Base Case	26	3,581	0
No Imports	65	0	0
No Imports – Largest Acre Buildout	114	0	0
Without RECs	0	3,578	231

Arbitrage value in New York’s system (modeled under the assumption that energy storage can charge from the grid) allowing for imports of lower cost energy and exports of higher cost energy.

Table 7 presents the results of the optimization model for the Phase I modeled scenarios. The “Base Case” configuration allows for imports from the grid for hybridized charging of battery storage and considers energy prices, capacity prices, and REC prices for maximizing the value of clean energy exports. In the Base Case scenario, the model selects a mix of solar and 4-hour storage, but no long duration energy storage (LDES).

While long duration storage can discharge for much longer, it receives less capacity credit per acre compared to 4-hour storage, so it is not selected by the model. If capacity prices drop from current forecast levels and/or if 4-hour storage receives significantly lower accreditation (which could occur with saturation of shorter duration storage), the model would select relatively more long duration storage.

The scenario variants from the Base Case provide important insights into the impact of different modeling assumptions. With bidirectional charging (i.e. imports), storage resources are economic at a large scale due to their relatively small footprint compared to solar. The “No Import” scenarios

do not allow transmission from the NYC grid to charge the storage resources (and therefore no fossil fuel resources can contribute to storage). To model this scenario, capacity prices are eliminated, which disincentivizes storage resources. Without imports, the model only builds solar to the maximum extent possible (65 MW with the 196-acre land availability assumption and 114 MW with the maximum land available of 343 acres).

The “Without RECs” scenario illustrates the importance of REC prices to incentivize clean energy based on the economic tradeoffs. If RECs are removed (but capacity prices and imports remain), the model does not select any solar. However, solar alone might be desirable to maximize clean energy generation in Phase I. If the goal of Renewable Rikers is to maximum exports of clean energy, rather than maximize the monetary value of energy, then the “No Imports” scenario with all solar (up to 114 MW) might be a more desirable portfolio. Without solar incentivized through RECs, the model instead selects long duration storage once shorter duration storage is exhausted, indicating that longer duration storage is now the most economical (rather than solar).

Table 8 provides the annual generation and export levels for each scenario in Phase I. Because storage resources are not generators, all generation is attributable to solar alone. The quantity of imports from the grid is equal to the difference between exports and generation (minus the efficiency losses of the storage). Imports have associated carbon emissions in Phase I due to the continued reliance upon fossil fuel resources.³²

The Phase I scenarios underscore the importance of offshore wind at Renewable Rikers to achieve impactful levels of generation. The maximum solar generation in Phase I is less than 1% of generation

32. New York Department of Buildings estimates that 2030 carbon emissions from the NYC grid will have a rate of 0.000288962 tons of CO₂ per kWh. New York City Department of Building Rules. (2022, October 11). Section 103-14 of Chapter 100 of Title 1 of the Rules of the City of New York.

TABLE 8. PHASE I DETAILED ANNUAL GENERATION AND EXPORTS RESULTS

SCENARIOS	GENERATION (MWH)	EXPORTS (MWH)	IMPORTS (MWH)
Base Case	49,346	5,961,233	6,981,020
No Imports	126,011	126,011	0
No Imports– Largest Acre Buildout	220,519	220,519	0
Without RECs	0	6,094,069	7,279,014

Note: All scenarios in Phase I have zero curtailment of generating resources (i.e. solar). The transmission constraint in Phase I is not binding; neither generation exports nor imports for battery storage charging reach the 3,500 MW transmission limit in any hours for any scenario configurations.

from fossil fuel resources in 2024 (see Table 2). Solar as the lone generating resource simply cannot be built at a large enough scale at Rikers Island due to land constraints. Given the goal of using Renewable Rikers to propel NYC and New York State towards their decarbonization mandates by 2035, Phase I can provide a steppingstone of initial resources, but Phase II with interconnection to offshore wind will be necessary for large-scale decarbonization.

With capacity prices, battery storage is economic in Phase I, but because storage is not a generating resource it can only contribute to NYC decarbonization to the extent that the grid it uses to charge from is comprised of clean energy. That said, deploying energy storage in Phase I has other advantages. With economic dispatch, energy storage will supply generation during the highest cost hours, displacing the generation for NYC’s most expensive and heavy-emitting fossil fuel plants. Storage can also replace fossil-fuel assets in ancillary service markets (including reactive power, regulation and frequency response) and reserves. If NYC’s goal is to lower reliance on fossil-fuel plants in the energy, capacity, and ancillary

services markets, then storage in Phase I can play an influential role.

PHASE II

Phase II represents the long-term potential for full buildout of Renewable Rikers with connection to 6 GW of offshore wind and sufficient completion of the WRRF facility to incorporate solar and storage within the WRRF footprint. If the WRRF site takes up 145 acres of land, it can host 33 MW of rooftop solar. The model must select this amount as a minimum for all scenarios.³³ The Phase II model incorporates energy, capacity, and REC prices as of the year 2040, and removes the tax credit for storage resources. All scenarios in this phase also account for land requirements for the offshore wind converters (41 acres for 6 GW).

Table 9 presents the results for all Phase II scenarios. In the “Base Case” scenario, the model does not select any long duration storage or additional solar beyond minimum solar within the WRRF footprint. Instead, the capacity prices incentivize building as much 4-hour storage as possible.

Without capacity prices or the ability to charge from the grid—the “No Imports” scenario—all land (less the area for the offshore wind converters and the WRRF) is instead used to construct solar and the maximum possible is selected. In this scenario, arbitrage values from storage are insufficient without capacity prices to incentivize additional storage. The “Without REC” scenario does not result in a different portfolio than the Base Case, suggesting that capacity prices alone are driving the results.

The “Solar in Floodplain” scenario increases the land available by considering elevated solar within the floodplain by requiring the model to select 50 MW of solar. Because this scenario does not change the underlying economics, only

33. The 33 MW is calculated based upon 7.5 MW per acre of solar buildout for the Wards Island WRRF. See Appendix for additional information about land and area assumptions.

TABLE 9. PHASE II OPTIMIZATION MODEL RESULTS

SCENARIOS	SOLAR (MW)	4-HOUR STORAGE (MW)	LONG DURATION STORAGE (MW)
Base Case	33	1,685	0
No Imports	52	0	0
Without RECs	33	1,685	0
Solar in Floodplain	50	1,713	0
High Transmission	33	1,685	0
8 GW Offshore Wind	33	737	54
Low Storage ELCC	33	0	168

the minimum amount of solar is built and the remainder is 4-hour storage (similar to the Base Case scenario).

In Phase II, the transmission constraint becomes binding, and exports are limited by the 3,500 MW transmission constraint in 21% of hours in the Base Case scenario. The “High Transmission” scenario increases transmission from 3,500 MW to 5,000 MW. Because the economic tradeoffs are static there is no change to the resource portfolio, but curtailments are reduced to zero for all hours.

Energy generated from solar or offshore wind resources connected through Rikers Island will need to be transmitted to the load centers. If at any hour of the year, the solar and wind energy (minus the consumption of the WWTF) surpasses the amount that can be transmitted through the available infrastructure, the amount over that limit will need to be either stored or curtailed. Consequently, energy storage can be used to reduce curtailment by storing electricity to be transmitted during hours that the transmission limit is not (otherwise) binding.

TABLE 10. PHASE II DETAILED ANNUAL GENERATION RESULTS

SCENARIOS	GENERATION (MWH)	EXPORTS (MWH)	IMPORTS (MWH)	CURTAILMENT (MWH)	CURTAIL. AS % OF GEN
Base Case	19,192,691	18,431,377	1,938,762	1,825,723	9.5%
No Imports	19,228,759	16,054,073	0	2,736,686	14.2%
Without RECs	19,192,691	17,932,929	1,440,314	1,825,886	9.5%
Solar in Floodplain	19,225,512	18,490,537	1,969,298	1,823,526	9.5%
High Transmission	19,192,691	21,699,662	2,963,245	0	0%
8 GW Offshore Wind	25,715,017	19,172,631	710,039	6,548,831	25.5%
Low Storage ELCC	19,192,691	16,376,533	101,927	2,283,754	11.9%

Note: Generation, exports, and curtailment net of the average annual load for the WRRF facility (438,000 MWh as estimated by NREL Study of 25,000 kW/30-min, equal to a flat load of 50 MW). Generation reflects only renewable generation and can be larger than exports due to both curtailments and line losses.

Table 10 shows the generation, exports, imports, and curtailment for each Phase II scenario. With 6 GW of offshore wind there are hours where energy generation exceeds the transmission limit. If there is storage available, curtailment can be avoided, but if there is not then the generation over 3,500 MW in one hour must be curtailed because it cannot be stored or exported.

The “8 GW of Offshore Wind” scenario increases generation without adding additional transmission, resulting in 25.5% of generation curtailed (compared to 9.5% in the Base Case). This scenario has a larger share of long duration storage compared to 4-hour batteries, reflecting a higher value of more flexible storage with a more constrained system. The “8 GW of Offshore Wind” scenario demonstrates that incremental wind resources above 6 GW, even if available, would provide limited value to the system if not accompanied by investments in transmission infrastructure to allow for larger exports. In addition, more offshore wind may not be necessary to meet CLCPA goals of 9 GW, depending on the offshore wind interconnections that occur

elsewhere in the state (such as at Brooklyn Clean Energy Hub and/or Renewable Ravenswood).

Lastly, the “Low Storage ELCC” scenario reduces the effective load carrying capacity (ELCC)³⁴ for both 4-hour and long duration storage resources, which also lowers capacity payments because ELCCs are used to calculate payment levels. Because long duration is relatively more competitive per acre, the model switches from selecting all short duration to all long duration storage. With lower ELCC's and capacity payments, the ability to store energy more flexibly (i.e. increase storage capacity in MWh through LDES) is selected over the ability to add more storage capacity in MW (as would happen with shorter duration storage). This scenario also highlights the sensitivity of the results to different assumptions and future conditions.

34. ELCC quantifies a generating resource's dependable contribution to system reliability by measuring its ability to supply power during times of peak demand or potential capacity shortfall. Expressed as a percentage of nameplate capacity, a 100-MW solar project with an ELCC of 25% would be credited with 25 MW of firm capacity.

METRICS & VALUATIONS

The NREL Study evaluated important metrics for the buildout of Renewable Rikers for each of the scenarios it considered. The study placed particular emphasis on total costs and economic impacts (i.e. jobs, labor income, and Gross Domestic Product), but it did not evaluate the wider benefits of replacing fossil fuel energy generation with clean energy resources. This study builds upon the findings of the NREL Study to calculate similar values for the updated Phase I and II buildouts of Renewable Rikers, with the addition of expanded metrics to measure the benefits of reduced fossil fuel generation.

MARKET VALUE OF RENEWABLE ENERGY AND STORAGE

The market value of future clean energy resources at Renewable Rikers falls into three categories, energy, capacity, and environmental attributes.³⁵

The **energy benefit** refers to the dollar value of energy exports from Rikers Island. In New York, energy values are measured by locational marginal prices (LMPs). With bidirectional storage where batteries can charge from the city grid (up to

transmission limits) the energy revenue value reflects arbitrage from lower cost imports to charge and higher cost exports when the grid is more constrained.

The **capacity benefit** reflects the value of having the resource available to meet peak demand and maintain system reliability. Clean energy at Renewable Rikers, particularly battery storage and offshore wind, also offer capacity benefits, with longer duration storage having some of the highest capacity accreditation values. In New York there is a formal capacity market known as the New York Installed Capacity (ICAP).

In addition to the avoided energy and capacity costs, New York, like many states across the country, has a standard by which certain qualifying renewable generation assets are awarded one **Renewable Energy Certificate (REC)** for each MWh of electricity delivered to the grid. RECs value the environmental attributes of clean energy generation and provide the ability for renewable generators to receive additional revenue to support their development.

Together, these three revenue streams define the value of any energy resource to the grid, with energy revenues tied to actual production,

³⁵ See Appendix for additional information about market prices and model inputs.

TABLE 11. DETAILED MARKET VALUE RESULTS FOR BASE CASE SCENARIOS

SCENARIO	ENERGY REVENUES	CAPACITY PAYMENTS	REC REVENUES	TOTAL ANNUAL REVENUES
PHASE I				
Solar: 26 MW 4-hr Storage: 3,582 MW LDES: 0 MW	\$59.8 million	\$543.6 million	\$1.8 million	\$605.2 million
PHASE II				
OSW: 6,000 MW Solar: 33 MW 4-hr Storage: 1.685 MW LDES: 0 MW	\$478 million	\$1.481 billion	\$1.184 billion	\$3.143 billion

capacity revenues tied to system adequacy needs and resource availability, and RECs reflecting the market value of clean energy generation. The model's inputs reflect forecasts of 2030 and 2040 energy and capacity prices, while renewable energy credit (REC) prices are based on 2024 values (inflated for years 2030 and 2040).

Table 11 provides the energy, capacity, and REC revenues for the Phase I and Phase II base scenarios. The results for the market values scale with higher levels of generation and capacity incorporated into Renewable Rikers. Accordingly, Phase II has higher market values, corresponding to the higher amount of generation due to offshore wind. Energy revenues consider the revenue from exports from the grid resulting from both clean energy generation as well as the arbitrage value of storage (buying low imports to sell at higher levels to export).

AVOIDED FOSSIL FUEL GENERATION & DECARBONIZATION BENEFITS

While the NREL Study estimated the amount of clean energy generation for each of the scenarios evaluated, the analysis did not go a step further to estimate the extent to which that generation will offset future generation from fossil fuel resources. This section provides the results for the updated Phase I and Phase II Renewable Rikers portfolios.

Renewable Rikers is positioned to be part of the decarbonization solution in NYC by displacing generation from the aging fossil fuel plants. The

amount of fossil fuel generation that can be replaced by Renewable Rikers will vary depending upon the plants that are still operational once Renewable Rikers is connected to the grid, as well as the timing and magnitude of the ultimate build out.

In consideration of future uncertainties, this analysis uses a range to estimate the amount of fossil fuel generation avoided by renewable energy generation at Renewable Rikers³⁶ based on the following maximum and minimum values:

Maximum Avoided Fossil Fuel Generation:

Under these assumptions, all renewable generation at Renewable Rikers offsets fossil fuel generation. Because most gas turbine peaker plants are set to retire by 2030, the displaced fossil fuels are assumed to all be from combined cycle and steam cycle plants. The maximum range applies an emission rate of 0.399 tons CO₂ of per MW, based on the weighted average of emission rates from combined cycle and steam cycle plants (see Table 3 in Section 2.2)

Minimum Avoided Fossil Fuel Generation:

The lower-level assumption assumes that NYC can achieve its grid decarbonization mandates and uses the NYC Department of Buildings emission rate estimate for 2030-2034 of 0.145 tons of CO₂ per MW.³⁷

36. The analysis evaluates and quantifies the benefits of the clean electricity that Renewable Rikers can supply to the grid (exports), rather than the total amount of electricity generated (generation).

37. New York City Department of Building Rules. (2022, October 11).

TABLE 12. RANGE OF ANNUAL AVOIDED FOSSIL FUEL GENERATION & AVOIDED COST

	EXPORTED GENERATION	TONS OF CO ₂		AVOIDED COST OF CARBON (\$)	
	MWh	Minimum	Maximum	Minimum	Maximum
PHASE I	49,346	7,155	19,669	\$1.9 million	\$5.2 million
PHASE II	18,431,377	2,387,540	6,563,384	\$634 million	\$1,744 million

Note: "Exported Generation" is renewable generation less curtailments (not including imports). "Avoided Cost of Carbon" is in 2025 dollars (see Footnotes 21 and 22) and discounted at a 3% rate.

The range of avoided fossil fuel generation is meant to be illustrative of magnitude of emission reductions and avoided social costs of carbon possible for each phase of Renewable Rikers. The benefits from Rikers Island resources depend on the cost and environmental attributes of the energy that they will be displacing, which are highly uncertain looking 15 years into the future or more (as is necessary for the Phase II projections).

Table 12 provides the range of potential annual avoided fossil fuel generation for both phases, the corresponding levels of reduced carbon emissions, and the social cost of emissions. Phase II could avoid up to 6.6 million tons of CO₂ per year, equivalent to removing 1.3 million gas-powered cars from the road.³⁸

Phase I, with a representative year of 2030, is more likely to be closer to the maximum levels as the NYC grid is more likely to continue to be heavily reliant on fossil fuel resources. Phase II is likely to be closer to the minimum value, or even below the minimum, if NYC experiences large-scale grid decarbonization prior to completion of Renewable Rikers (which may be unlikely given the status of offshore wind and additional transmission projects into NYC).

Under CLCPA, New York is required to achieve a 70% reduction in electricity emissions. Phase II of Renewable Rikers has the potential to avoid up to 6.6 million tons of CO₂ emissions, representing a 55% reduction compared to the emissions in NYC fossil fuel plants in 2024 (11.7 million tons of CO_{2e})³⁹ and 1.5% of the 451 million CLCPA baseline CO₂ emissions statewide from all sources.⁴⁰

Section 103-14 of Chapter 100 of Title 1 of the Rules of the City of New York. <https://rules.cityofnewyork.us/rule/procedures-for-reporting-on-and-complying-with-annual-greenhouse-gas-emissions>.

38. U.S. Environmental Protection Agency website, Greenhouse Gas Equivalencies Calculator: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.

39. See Table 3 in Section 2.2.

40. 6 CRR-NY 496.4 defines baseline emissions as 1990 levels of 409.78 million metric tons, equivalent to approximately 451 million tons.

AVOIDED HEALTH COSTS OF FOSSIL FUEL EMISSIONS

Many of the existing fossil fuel plants in NYC are in or adjacent to neighborhoods with higher proportions of low-income and minority residents, creating a long-standing pollution burden and injustices. When fossil fuel plants generate, they release harmful pollutants that increase the risk of disease and mortality for surrounding communities. These localized health costs result in externalized costs to society that are not paid for by the generators or otherwise captured within market transactions.⁴¹

Table 13 estimates the range of avoided emissions and cost by pollutant for each phase of Renewable Rikers. The minimum and maximum range values are constructed using the same methodology as carbon emissions, specifically:

Maximum:

All generation offsets either combined cycle or steam cycle fossil fuel emissions (there are no gas turbine peaker plant emissions), using 2024 emission intensity levels per MW.

Minimum:

Reflects grid decarbonization to meet CLCPA goals and corresponds to a 64% decrease in fossil fuel emission intensities from 2024 levels to projections of grid emissions in 2035.⁴²

By reducing the energy generated from the fossil fuel plants in NYC with clean, non-emitting, and non-polluting resources, Renewable Rikers is a pathway for improved health conditions in the neighborhoods affected by the legacy of harmful power generation. The magnitude of avoided health costs will be larger with higher levels of renewable energy generation and storage at Renewable Rikers.

41. Greenhouse gas emissions are also sources of externalized costs from fossil fuels and are represented by the social cost of carbon, which includes health costs (among other costs).

42. Based upon the reduction in emissions intensity levels from current fossil fuel generation (0.399 tons CO₂ per MW, excluding gas turbines) to projections through 2034 from New York Department of Buildings (0.145 tons CO₂ per MW).

TABLE 13. AVOIDED POLLUTANT EMISSIONS & COSTS FROM RENEWABLE RIKERS

	AVOIDED EMISSIONS (TONS)		AVOIDED HEALTH COST (\$, MILLIONS)	
	Minimum	Maximum	Minimum	Maximum
PHASE I				
PM _{2.5}	0.6	1.7	\$0.8	\$2.3
SO _x	0.1	0.4	\$0.0	>\$0.1
NO _x	1.4	3.8	\$0.1	\$0.1
Phase I Total	2.1	5.8	\$0.9	\$2.5
PHASE II				
PM _{2.5}	230	632	\$317.5	\$873.6
SO _x	52	142	\$6.0	\$16.5
NO _x	509	1,402	\$19.2	\$52.8
Phase II Total	791	2,175	\$343.7	\$943.0

Source: Calculated by CEG with plant-level emission data from S&P Insights and cost data from EPA COBRA.

Note: All dollar values are in real 2025 dollars.

EXPENDITURES & ECONOMIC IMPACTS

The estimated annualized levelized cost of the Phase I Base Case portfolio is \$582 million, which is primarily for the 4-hour storage resources. Phase II has a higher estimated annualized levelized cost of \$1.164 billion, of which two-thirds is for the offshore wind converters. Table 14 summarizes the levelized costs of capital for each of the two phases.

The NREL Study used two in-house tools to analyze economic impacts: Renewable Energy Integration & Optimization Tool (ReOpt) and Jobs & Economic Development Impact Models (JEDI).

ReOpt estimates capital costs and operating expenses, while JEDI is used to estimate economic impacts in terms of jobs, earnings, output, and Gross Domestic Product (GDP). This analysis uses a NREL tool to estimate capital and operating costs, the NREL Average Technology Baseline (ATB).^{43,44} This tool is commonly used for utility-scale planning and has projections for different resource technology types through 2030.

Spending on capital expenses and operations and maintenance costs supports economic impacts that are measured in terms of jobs, earnings, output, and Gross Domestic Product (GDP). This

43. REopt is a webtool developed by NREL that is used to evaluate the economic viability of distributed energy resources. More information at: <https://reopt.nrel.gov/tool>.

44. More information about the NREL 2024 Electricity Annual Technology Baseline is available at: <https://atb.nrel.gov/electricity/2024/about>.

TABLE 14. ANNUALIZED CAPITAL COST BY PHASE AND RESOURCE TYPE

PHASE	TECHNOLOGY	MW	COST (MILLIONS)
PHASE I	Solar	26	\$3.1
	Storage (4-hour)	3,581	\$579.1
	LDES	0	\$0.0
	Total	3,607	\$582.2
PHASE II	Solar	33	\$3.5
	Storage (4-hour)	1,685	\$386.4
	LDES	0	\$0.0
	Offshore Wind Converter	N/A	\$774.7
	Total	1,718	\$1,164.6

Source: NREL ATB inflated to nominal values for all but "Offshore Wind Converter" which uses estimates from the NREL Study.

analysis does not conduct a full economic input-output analysis, as that is not the focus of this report. Instead, order of magnitude impacts are estimated based upon levelized values of economic impacts per MW as the NREL Study (Scenario 5).⁴⁵ Table 15 provides the construction and installation impacts, while Table 16 details the operations and maintenance impacts for each Phase.

The Phase II economic impacts reported below do not account for the impact of offshore wind, as only the offshore wind converters are attributable to Renewable Rikers. Despite clean energy generation being over 400 times larger in Phase II, the expenditures and economic impacts of Phase II are lower than Phase I due to this difference.

TABLE 15. ECONOMIC IMPACTS OF CAPITAL EXPENDITURES (BASE SCENARIOS)

	RESOURCE TYPE	JOBS	EARNINGS	OUTPUT	GDP
PHASE I	Solar	118	\$9.2	\$17.9	\$13.3
	Storage (4-hour)	1,480	\$199.5	\$445.0	\$277.5
	Total	1,599	\$208.8	\$462.9	\$290.8
PHASE II	Solar	150	\$11.7	\$22.7	\$16.9
	Storage (4-hour)	697	\$93.9	\$209.4	\$130.6
	OSW	456	\$41.0	\$64.4	\$50.5
	Total	1,303	\$146.6	\$296.5	\$198.0

Note: Dollar values in 2027 values (consistent with the NREL Study).

TABLE 16. ECONOMIC IMPACTS OF O&M EXPENDITURES (BASE SCENARIOS)

	RESOURCE TYPE	JOBS	EARNINGS	OUTPUT	GDP
PHASE I	Solar	6	\$0.4	\$0.7	\$0.5
	Storage (4-hour)	696	\$64.1	\$200.8	\$122.3
	Total	702	\$64.5	\$201.5	\$122.9
PHASE II	Solar	7	\$0.5	\$0.9	\$0.7
	Storage (4-hour)	327	\$30.2	\$94.5	\$57.6
	OSW	58	\$1.5	\$4.7	\$2.3
	Total	393	\$32.2	\$100.1	\$60.6

Note: Dollar values in 2027 values (consistent with the NREL Study)

SUMMARY AND RECOMMENDATIONS

Renewable Rikers represents one of New York City's most promising opportunities to meet its clean energy, decarbonization, and environmental justice goals. The site's unique location—large, isolated, and proximate to major load centers—makes it a rare, viable space for integrating renewables, energy storage, and wastewater resource recovery within city limits.

This expanded feasibility analysis builds on the NREL's Study and the WRRF Study to quantify the benefits of Renewable Rikers under varying build scenarios. Using an optimization model incorporating updated inputs and constraints, this analysis evaluated both near-term (Phase I) and long-term (Phase II) portfolios to maximize economic value of clean energy. The primary portfolios are evaluated in terms of their market value, cost, economic impacts, and potential values from reduced fossil fuel emissions.

KEY FINDINGS

The findings underscore the importance of strategic planning and coordination to realize the full value of Renewable Rikers. While Phase I offers a pathway for early deployment of solar and battery storage, Phase II unlocks transformative potential through offshore wind integration and co-location with the planned WRRF. The modeling

results highlight the critical role of transmission infrastructure, the economic competitiveness of storage technologies, and the broader societal benefits of decarbonization.

PHASE I: EARLY DEPLOYMENT

Following jail closure and site preparation, between 65 and 114 MW of solar and 3.5 GW of storage could be deployed before WRRF construction and offshore wind interconnection.

- » If hybridized grid charging is permitted, battery storage dominates the optimized portfolio due to high-capacity payments and arbitrage revenue. Without imports, solar fills the available footprint as arbitrage values of energy costs, capacity values, and storage potential are not high enough to incentivize storage buildout. However, even without consideration of these factors, higher levels of storage could be desirable for using Phase I as a bridge to Phase II.
- » Although modest in total generation (approximately 49 GWh per year), early deployment of clean energy in Phase I through solar and grid imports supports existing capacity needs and lays the groundwork for future buildout in Phase II.
- » Phase I could avoid up to 19,670 tons of CO₂ per year, equivalent to removing up to 4,000 cars from the road, while providing a replicable template for urban storage-solar integration.

PHASE II: TRANSFORMATIVE CLEAN ENERGY HUB

- » Full buildout with 6 GW of offshore wind, 33 MW of solar within the WRRF, and ~1.7 GW of 4-hour storage transforms Rikers Island into a cornerstone of New York's zero-emission grid.
- » Phase II generation (up to 19 TWh per year) could offset up to 6.5 million tons of CO₂ annually, a 55% reduction relative to 2024 NYC fossil emissions, valued at up to \$1.7 billion in avoided carbon costs each year.
- » Avoided health costs from local pollutants (NO_x, SO_x, PM_{2.5}) are valued at up to \$943 million annually. Pollution reductions from reduced fossil fuel generation would benefit environmental justice communities near existing plants.
- » Economic impacts from capital spending and operations would support thousands of jobs and hundreds of millions in GDP during construction and operation phases.

TRANSMISSION IS LIMITED BUT NOT OVERLY CONSTRAINING

- » The 3,500 MW transmission limit allows substantial renewable exports but leads to curtailment (~9.5 % of generation in the Base Case scenario).
- » Expanding transmission to 5,000 MW eliminates curtailment but may not be cost-effective unless offshore capacity exceeds 6 GW or multiple clean-energy hubs (e.g., Ravenswood, Brooklyn Clean Energy Hub) are co-optimized.
- » Phased coordination with Con Edison, NYPA, and NYISO is essential to manage interconnection, reliability, and capacity accreditation.

ENERGY STORAGE PROVIDES RESILIENCE AND ECONOMIC FLEXIBILITY

- » Storage mitigates curtailment, balances offshore wind and solar intermittency, provides peak-capacity value, and allows for maximum energy values through arbitrage behavior.
- » Under future lower capacity accreditation scenarios, long-duration storage (≥ 100 hours) becomes more valuable, suggesting potential for demonstration pilots with emerging technologies.

BROADER POLICY AND SOCIAL OUTCOMES

- » Renewable Rikers supports CLCPA mandates (70% renewables by 2030; 100% zero emission electricity by 2040), Local Law 97 compliance by powering the WRRF, and the closure of the gas turbine peaker plants.
- » By substituting clean generation for polluting fossil fuel plants (such as those located in Astoria, South Bronx, and Brooklyn) the project directly advances environmental justice goals of reducing disproportionate pollution burdens in vulnerable communities.

RECOMMENDATIONS

Achieving the vision of Renewable Rikers will require sustained leadership, early action, and alignment among City, State, and community stakeholders. The following recommendations translate the modeling insights into actionable next steps to be taken as soon as possible.

NEAR-TERM ACTIONS (2025–2030): EARLY DEPLOYMENT & COORDINATION

Establish and fund a City-led Renewable Rikers Task Force.

- » Include representatives from NYC-EJA, Department of Environmental Protection (DEP), Mayor's Office of Climate & Environmental Justice (MOCEJ), NYPA, and community groups to oversee planning, engagement, and funding pursuits.
- » Develop a Master Plan integrating energy, WRRF, and environmental justice goals.
- » Account for the full suite of benefits and costs in all future planning, including all benefits of avoided fossil fuel emissions.

Align with statewide clean energy infrastructure planning.

- » Ensure Renewable Rikers is integrated into NYISO System Resource Outlook and NYSERDA Transmission Planning scenarios.
- » Coordinate with parallel projects like Clean Path NY and Renewable Ravenswood for optimized grid benefits.

Initiate permitting and design for Phase I solar + storage.

- » Target readiness by 2030 to demonstrate site viability and deliver early clean capacity resources.
- » Pursue federal tax credits for storage before credit phasedowns (2032).

Engage offshore wind developers early.

- » Explicitly identify a primary and backup offshore wind project for Phase II connection (e.g. Beacon Wind or Empire Wind 2).
- » Coordinate on converter station design, construction sequence, and land requirements, timelines, and cost estimates.
- » Monitor offshore wind market developments, including permitting, construction timelines, and interconnection plans, to ensure Renewable Rikers remains aligned with broader state energy strategies.

Clarify and secure transmission access.

- » Work with Con Edison and NYISO to confirm basis for 3.5 GW hosting capacity and evaluate incremental expansion viability to 5 GW.
- » Explore waitlist opportunities for energy storage interconnection to ensure timely deployment and grid integration, including interconnection synergies with Brooklyn Clean Energy Hub and Astoria Substation.

Pilot long-duration energy storage technologies.

- » Partner with NYPA or NYSERDA to test \geq 100-hour LDES systems to mitigate wind curtailment and enhance resilience.

MID-TERM PLANNING (2030–2040): INTEGRATION & OPTIMIZATION

Integrate solar and storage within WRRF design.

- » Incorporate rooftop solar and onsite battery storage into WRRF architectural plans to maximize synergies and resilience.

Conduct detailed transmission and curtailment studies.

- » Quantify cost-benefit trade-offs of curtailment vs. transmission expansion.
- » Evaluate alternative export pathways (e.g., DC links to Brooklyn or Queens nodes).

APPENDIX

MODEL INPUTS AND ASSUMPTIONS

LAND & AREA ASSUMPTIONS

PARAMETER	VALUE	SOURCE
BUILDABLE LAND ASSUMPTIONS		
Rikers Island Total Footprint	413 acres	NREL Study
Future sea level rise excluded area	51.55 acres	NREL Study
Buffer for access roads, easements, etc.	18.07 acres	NREL Study
Phase 1: Maximum available area	343.38 acres	Calculated from prior parameter values
WRRF Footprint	245 acres	NREL Study/WRRF Study
Unconstrained area with WRRF	98 acres	Phase 1 maximum available area less WRRF footprint
Portion of WRRF available for solar and storage	40%	Calculated from solar and storage of Wards Island WRRF
Phase 2: Maximum available area	196 acres	Unconstrained area plus WRRF available area
Phase 2: Maximum available area with elevated solar in floodplain	248 acres	Phase 2 maximum available area plus floodplains
Phase 2: Maximum solar within WRRF Footprint	33 MW	Calculated from Wards Island WRRF comparative values

LAND AND AREA ASSUMPTIONS (CONTINUED)

PARAMETER	VALUE	SOURCE
RESOURCE LAND REQUIREMENTS		
Solar (unconstrained lands)	3 acres/1 MW	NREL Study
Solar (with WRRF)	7.5 acres/1 MW	Wards Island WRRF with solar ⁱⁱ
Battery storage (4-hour)	0.033 acres/ 1 MW	NREL Study
Battery Storage (100-hour)	0.33 acres/1 MW	Form Energy
Offshore Wind Converter	0.006797 acres/ 1 MW	NREL Study (40.78 acres for 6 GW offshore wind converter)

ii. Wards Island WRRF is an approximately 75-acre area and the site of 10 MW of solar and 10 MW of storage resources. More information at: <https://www.nyc.gov/site/dcas/news/007-25/dcas-dep-nypa-launch-groundbreaking-solar-project-wards-island>.

BASE CASE LAND FOOTPRINTS

PHASE I: BASE CASE LAND USAGE

	SOLAR	ENERGY STORAGE	TOTAL
MW Built	26 MW	3,581 MW	3,607 MW
Acres Used	78 acres	118 acres	196 acres

PHASE II: BASE CASE LAND USAGE

	SOLAR (WITH WRRF)	ENERGY STORAGE	OSW CONVERTER	TOTAL
MW Built	33 MW	1,685 MW	6,000 MW	7,718 MW
Acres Used	99 acres	55 acres	41 acres	195 acres

MARKET PRICE ASSUMPTIONS

AVERAGE MARKET VALUES FOR PHASE I AND PHASE II		
	PHASE I (2030)	PHASE II (2040)
Avg. Hourly LMP (Market Value)	\$32.04/MWh	\$30.37/MWh
Avg. Monthly ICAP Price (Capacity Value)	\$193,075/MW-year	\$426,246/MW-year
REC Price (Tier 1 REC Value)	\$36.18	\$68.20

Source: S&P Insights for New York Independent System Operator (NYISO), Region J – NYC.

Note: All values are nominal

RENEWABLE RESOURCE ASSUMPTIONS

METRIC	ASSUMPTION	DATA SOURCE
Wind Construction timeline (generation and interconnection)	Approx. 7 years	Permitting to operational for Empire Wind ⁱⁱⁱ
Solar Construction timeline	~1 year	Permitting to operational ^{iv}
Battery Construction timeline	~ 3 years	Battery Energy Storage Systems Report ^v
Storage Investment Tax Credit (ITC)	30%	U.S. Department of Treasury ^{vi}
Solar - ELCC	12.73%	NYISO - 2025-2026 Final CAFs (NYC) ^{vii}
4-hour Storage - ELCC	78.53%	NYISO - 2025-2026 Final CAFs (NYC)
Long Duration Storage -ELCC	100%	Estimated from 8-hour storage NYISO - 2025-2026 Final CAFs (NYC)
Offshore Wind - ELCC	35.79%	NYISO - 2025-2026 Final CAFs (LI)
Solar – Annualized Capital Cost ^{viii}	\$118,608/MW (2030) ^{ix} \$105,716/MW (2040)	NREL 2024 Electricity ATB
4-hour Storage - Annualized Capital Cost	\$161,710/MW (2030) \$229,331/MW (2040)	NREL 2024 Electricity ATB
Long Duration Storage - Annualized Capital Cost	\$216,285/MW (2030) \$292,235/MW (2040)	Form Energy

iii. Empire Wind website: <https://www.empirewind.com/project>.

iv. Solar Energy Industries Association website: <https://seia.org/research-resources/utility-scale-solar-power-federal-lands-permitting-process>.

v. Idaho National Laboratory. (2024, November 1). Battery energy storage systems. U.S. Department of Energy. Page 71. https://www.energy.gov/sites/default/files/2025-01/BESSIE_supply-chain-battery-report_111124_OPENRELEASE_SJ_1.pdf.

vi. Under the July 4, 2025, U.S. Budget Reconciliation Bill H.R.1, battery storage (both 4-hour and LDES) is eligible for the Investment Tax Credit in 2030 (solar and wind are not) so it is included in Phase I. This credit is set to expire by 2036, so it is not included in the Phase II model specification.

vii. New York Independent System Operator. (No Date). Final Capacity Accreditation Factors for the 2025-2026 Capability Year. <https://www.nyiso.com/documents/20142/41593818/Final-CAFs-for-the-2025-2026-Capability-Year.pdf/44697251-aef0-433b-73f3-f524f3f63661>.

viii. "Annualized Capital Cost" reflects the average cost to build and operate a power plant over its entire lifetime. It accounts for all costs divided by the total expected electricity generation, allowing for the comparison of different electricity generation technologies at the same scale.

ix. All "Annualized Capital Cost" values are nominal, include fixed O&M, and are annualized at a 7% discount rate.

ECONOMIC IMPACTS

LEVELIZED ECONOMIC IMPACTS PER MW

	JOBS	EARNINGS	OUTPUT	GDP
CAPITAL EXPENDITURES				
Solar	0.55	\$42,903	\$83,125.48	\$61,674
Battery	0.28	\$37,269	\$83,125.48	\$51,845
OSW	0.59	\$52,921	\$83,125.48	\$65,184
OPERATIONS & MAINTENANCE				
Solar	2.59	\$181,616	\$311,341	\$246,478
Battery	1.08	\$99,420	\$311,341	\$189,682
OSW	3.84	\$99,364	\$311,341	\$152,358

Source: Calculated from NREL Study



WASTEWATER

RESOURCE

RECOVERY

FACILITY

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ABSTRACT

This report presents a detailed technical assessment of New York City's Renewable Rikers initiative, evaluating the feasibility, environmental, and equity implications of consolidating wastewater treatment operations onto Rikers Island. The analysis synthesizes findings from the City's Department of Environmental Protection (DEP) Feasibility Study (2024), the Current Energy Group (CEG) Renewable Rikers modeling assumptions (2025), and supporting documents from the New York State Department of Environmental Conservation (NYS DEC). The report expands upon technical, equity, and community engagement dimensions to assess how the Renewable Rikers project can serve as a transformative infrastructure and justice model for the South Bronx and Queens communities most impacted by environmental burdens.

INTRODUCTION

The Renewable Rikers initiative represents a pivotal moment in New York City's environmental and infrastructural evolution. By decommissioning correctional facilities and converting Rikers Island into a hub for renewable energy and wastewater treatment, the City has committed to an ambitious vision that merges climate mitigation, energy transition, and social justice. Under the Renewable Rikers Act (Local Law 31 of 2021), the Department of Environmental Protection (DEP) was tasked with evaluating the technical feasibility of consolidating the City's wastewater treatment capacity on Rikers Island while freeing waterfront space in the South Bronx and other boroughs for environmental restoration and public access.

This independent assessment builds upon prior studies to provide a comprehensive examination of the City's assumptions, data sources, and projections. The purpose is to offer an independent perspective grounded in academic rigor, focusing on technical feasibility, climate resilience, and environmental justice. The analysis also aims to support the New York City Environmental Justice Alliance (NYC-EJA) and coalition partners in advocacy and engagement by translating complex engineering findings into accessible narratives that highlight opportunities for equitable redevelopment.

DOCUMENT REVIEW AND BACKGROUND RESEARCH

The foundation of this report is an extensive document review encompassing the DEP's March 2024 Rikers Island Wastewater Resource Recovery Facility (WRRF) Feasibility Study and related documents. Together, these documents provide a technical and policy baseline for understanding the City's intentions to integrate wastewater treatment modernization with renewable energy and climate-resilient design. The DEP Feasibility Study proposes consolidating four existing WRRFs into a single, state-of-the-art facility capable of treating 705 million gallons per day (MGD) under average flow and 1,410 MGD during wet-weather peak conditions (DEP, 2024). The proposed facility would occupy roughly 245 acres of Rikers Island—approximately 60% of the total available land area—while reserving the remainder for renewable energy, composting, and community-benefit infrastructure. The City envisions the WRRF as a linchpin of a modernized wastewater and stormwater management network, designed to eliminate combined sewer overflows and reduce pollutant loading in the East River and Flushing Bay.

In parallel, CEG's 2025 Renewable Rikers Analysis provided an independent evaluation of renewable energy co-siting potential, focusing on the feasibility of integrating solar photovoltaic (PV), battery storage, and offshore wind. Their findings concluded that on-site renewable systems could offset 25–40% of WRRF energy consumption, contributing to both operational savings and emissions reductions. These analyses were conducted in accordance with New York

City's climate mandates under Local Law 97 and the state's Climate Leadership and Community Protection Act (CLCPA), which requires that 35% to 40% of climate investments accrue to disadvantaged communities.

A review of supporting regulatory documentation—including the Flushing Bay CSO Order (Ruderman, 2025)—reveals the interdependency between the Rikers WRRF and other major infrastructure investments. Specifically, the DEC correspondence confirms that design timelines for the Flushing Bay Tunnel and the WRRF must be aligned to optimize hydraulic performance and to avoid redundant capital expenditures. This finding underscores the need for systems-level coordination among City agencies to ensure that Renewable Rikers advances both engineering efficiency and environmental justice.

Comparative zoning and land-use analyses further contextualize the feasibility of infrastructure redevelopment on Rikers. The site's current Industrial Business Zone (IBZ) designation permits heavy infrastructure, making it one of the few viable locations within the city capable of supporting a large-scale WRRF without residential displacement. However, proximity to LaGuardia Airport and Federal Aviation Administration (FAA) height restrictions (<50 feet) limit the feasibility of elevated solar structures. These constraints necessitate the prioritization of low-profile renewable systems such as ground-mounted solar arrays and anaerobic digestion-based biogas recovery (Lombardi, Mendecka, & Fabrizi, 2020).

TECHNICAL AND SCENARIO ANALYSIS

The technical evaluation conducted as part of this scope of work assessed the assumptions underlying DEP's wastewater capacity projections, renewable energy integration models, and land-use requirements. Two principal design configurations were examined: (1) the City's 245-acre full-build WRRF scenario and (2) a 135-acre modular 'Core-Only' scenario proposed in [RPA's independent report](#) from 2022. The former prioritizes long-term expansion and full co-benefit integration (e.g., composting, renewable co-siting), while the latter emphasizes rapid deployment and cost efficiency.

Under the Core-Only configuration, phased implementation could enable wastewater treatment operations to begin within 10–12 years, compared to 20–25 years under the full-build model. The modular approach also provides flexibility for adaptive design—allowing future integration of new technologies without necessitating complete reconstruction. Such adaptability has been demonstrated in European WRRFs like Oslo's Bekkelaget plant and Hamburg's Jenfelder Au district, both of which operate under modular frameworks that enable incremental energy and process upgrades (Edwards et al., 2023).

The DEP (2024) Feasibility Study proposes an approximately 35-year program timeline for the Rikers Island WRRF, which includes (1) planning, environmental review, permitting, design, and site preparation, followed by (2) a multi-decade construction and commissioning process. Within

this framing, the construction period alone is anticipated to take approximately 20–25 years, while the additional ~10 years account for pre-construction activities.⁴⁶

Our independent analysis is therefore consistent with the City's assumptions: **the 20–25 year figure referenced in this report corresponds to the construction and commissioning phase, not the total program duration.**

That said, our findings suggest that the overall timeline could be shortened under certain conditions. If the jail closes by 2027, and if environmental review, master planning, and design phases are conducted in parallel—and if the WRRF adopts a modular, phased construction strategy—some components of the schedule could be accelerated. These approaches could reduce the total program duration to approximately 25–30 years, depending on permitting efficiency and construction sequencing. DEP itself notes that “any accelerations identified in planning and design will be incorporated” (DEP, 2024), indicating that a reduced timeline is plausible.

However, it is equally important to acknowledge that infrastructure megaprojects of this complexity face inherent risks—including procurement delays, regulatory requirements, and unforeseen

46. In some secondary summaries, this multi-decade horizon is rounded or described as approaching 40 years, particularly when additional contingencies or post-commissioning optimization are implicitly included. In the report, we intentionally use DEP's 35-year framing as the baseline, consistent with the primary source.

technological or geotechnical challenges—that may result in reverting to the original 35-year timeline.

From an energy perspective, DEP’s analysis estimates an annual power demand between 310 and 500 GWh, primarily for aeration, pumping, and dewatering operations. By contrast, renewable integration through anaerobic digestion and PV systems could offset between 25–40% of this demand. In similar systems worldwide—such as Singapore’s NEWater facility—biogas recovery and energy recycling have achieved net-zero operational energy balances, underscoring the potential for Rikers to model sustainable wastewater management.

Construction timelines represent a critical constraint, however. Given the interdependency with the Flushing Bay Tunnel and CSO compliance schedules, a phased construction approach could mitigate risk while allowing early delivery of environmental benefits.

Beyond engineering metrics, the technical assessment also incorporates resilience and systems integration considerations. The proposed WRRF would be located within the 100-year floodplain, requiring robust flood defenses such as levees, green shoreline infrastructure, and elevated electrical systems. Climate-resilient WRRF designs in Toronto and Rotterdam demonstrate how redundancy and modularity can enhance system reliability under increasing storm intensity (Garcés-Gómez et al., 2021). Thus, Renewable Rikers offers not only a technical solution but also a living laboratory for resilient urban design.

COMMENTARY ON THE APPROPRIATENESS OF THE PROPOSED WRRF CAPACITY

The New York City Department of Environmental Protection (DEP) proposes consolidating four

Upper East River Wastewater Resource Recovery Facilities (WRRFs)—Hunts Point, Tallman Island, Bowery Bay, and Wards Island—into a new facility on Rikers Island with an average flow capacity of 705 million gallons per day (MGD) and a peak wet-weather capacity of 1,410 MGD (DEP, 2024). The following is a more detailed evaluation of whether the proposed design capacity is technically appropriate, whether it supports the City’s long-term combined sewer overflow (CSO) reduction goals, and whether meaningful CSO reduction can be estimated based on available information.

APPROPRIATENESS OF PROPOSED CAPACITY

The proposed Rikers WRRF capacity appears technically justified. The average-day design flow of 705 MGD aligns with the aggregate average flow of the four existing WRRFs, whose individual capacities sum to the same value. This suggests the facility is appropriately sized to absorb all dry-weather flow from the drainage areas currently served by the four plants (DEP, 2024).

The peak capacity of 1,410 MGD—double the average flow—mirrors the traditional 2:1 ratio used for combined sewer hydraulic design within the New York City wastewater system. This approach is consistent with national CSO management frameworks and international examples such as Singapore’s Deep Tunnel Sewerage System and Oslo’s Bekkelaget WRRF, where consolidated systems use high peak-to-average ratios to accommodate storm intensity and long-term demand uncertainties (Marquez, 2025).

CAPACITY AND CSO REDUCTION POTENTIAL

The DEP feasibility study identifies the proposed deep conveyance tunnels as “double-duty infrastructure,” meaning they would both transport wastewater to the Rikers facility and provide stormwater storage during wet-weather events (DEP, 2024). By integrating conveyance and storage, these tunnels would increase upstream

system capacity and reduce overflow activation frequency.

While precise CSO reduction cannot be quantified without hydrologic modeling—including flow-frequency curves, baseline CSO volumes, and rainfall-event simulations—qualitative assessment suggests substantial potential. Similar large-system consolidation efforts in Boston and Chicago achieved reductions of 30–50 percent prior to full build-out of supplementary satellite controls. Given the scale of the proposed Rikers system and the addition of upstream storage, reductions of comparable magnitude appear reasonable.

ALIGNMENT WITH 2060 CSO ELIMINATION GOALS

The Renewable Rikers WRRF is identified by DEP as a critical pathway toward meeting the City’s goal of “virtually eliminating” CSO discharges by 2060 under PlaNYC (DEP, 2024). Without consolidation, the City would need to construct multiple large and costly CSO tunnels for each existing WRRF. Consolidation enables systemwide optimization and expands future flexibility for land reuse and stormwater management.

ASSESSMENT OF VALIDITY

The proposed Rikers Island WRRF capacity is consistent with existing flows, appropriately sized for future storm conditions, and positioned to support long-term CSO reduction goals. Although precise CSO reduction estimates require further modeling, the facility’s design and integrated conveyance system offer significant potential to

reduce overflows and improve East River water quality.

EXISTING WRRF MODULARIZATION

Given the proposed Rikers capacity, the future of existing WRRFs is mediated by the baseline water demands for facility operations. Allocating capacity solely to Rikers or limiting its use to wet-weather flows may lead to delays in water treatment from strained system flexibility.

One potential strategy for existing WRRFs is facility modularization. This approach would entail reconfiguring wastewater treatment infrastructure into multiple standardized units. Modularization would allow treatment processes to be both downscaled and optimized to meet production needs while also ensuring sufficient capacity to remain operational for short notice extreme wet weather conditions such as cloudbursts (Moreno, 2025). However, most modularity work has been done on localities who are developing sustainable wastewater treatment operations rather than as modifications on existing ones. Therefore further analysis is needed to assess the operational performance and cost implications of modularization across WRRFs.

RESILIENT DESIGN

OPTIONS

The current resiliency assumptions provided by NYC DEP factor in FEMA 100-year floodplain, Climate Resiliency Design Guidelines, Elevation of Mechanical and Electrical Systems, and Shoreline protection upgrade. Additional modifications not modeled for include expanded levees, setback requirements, treeline buffers, storm surge dissipation zones, sacrificial floodable zones, increased evapotranspiration buffer, as well as shoreline retreat. Given limited site conditions, incorporation of these missing items could significantly alter the buildable footprint and the feasibility of co-benefit inclusion.

While the DEP acknowledges that a detailed coastal resiliency design is pending development, the current developable acreage assumptions do not yet account for the land area needed for storm surge fortification which include:

- » 15–30 ft flood protection berms
- » 30–150 ft vegetated buffers
- » 50–200 ft riprap or hybrid living shoreline
- » Pumping stations with their own protective footprint
- » Setbacks for MBR, blower, and electrical buildings

GLOBAL BEST PRACTICES FOR WASTEWATER RESOURCE RECOVERY FACILITY RESILIENCY

RESILIENCY ELEMENT	TYPICAL FOOTPRINT	NOTES	SOURCES
Berms / Levees	30–90 ft width (each side)	Needed to handle 3–6 ft SLR + storm surge	(USACE, 2022; NYC DEP, 2020)
Vegetated buffer / treeline	30–100 ft	Needed to dissipate wave & wind energy	(FEMA, 2015; NOAA, 2022)
Floodable sacrificial zones	1–5 acres	Standard in EU coastal WRRFs	(Garcés-Gómez et al., 2021; European Commission, 2020)
Shoreline stabilization (riprap/living shoreline)	50–200 ft width	Varies by erosion and storm risk	(NOAA, 2021; USACE, 2020)
Redundant power systems	Additional 1–3 acres	Includes elevated substations	(EPA, 2024; Water Research Foundation, 2022)

The addition of these resiliency measures will likely push the Wastewater Resource Recovery Facility beyond its allocated footprint - demarcated by the current perimeter access road. Consequently, these buffer requirements will result in a 10 to 25% percent footprint expansion, shifting the 'Core-only' scenario from 135 acres to 150 - 170 acres. Several emerging implications from these constraints include a possible 15-35 acre decrease in co-benefits such as renewable energy, composting, and battery storage on land and their potential elimination in the southern or eastern sections of Rikers. Furthermore, protective

buffers combined with flight path restrictions will intensify spatial pressures across the site. While DEP's current assumptions are characterized as "reasonable," they should also be viewed as inherently optimistic, as they do not yet reflect the multi-layered coastal resiliency strategies and climate-adaptive infrastructure standards toward which New York City is actively transitioning. As these more robust requirements are incorporated, additional land area will likely be needed for protective systems, further constraining the developable footprint and the feasibility of co-benefit elements.

EQUITY AND RESILIENCY

ASSESSMENT

Equity and resiliency considerations are central to evaluating the Renewable Rikers initiative. The adjacent communities of Hunts Point, Mott Haven, and Astoria are among the most overburdened areas in the city, facing cumulative impacts from air pollution, heat exposure, and industrial zoning. According to the NYC Mayor's Office of Climate and Environmental Justice (2025), these neighborhoods have asthma rates 2.5 times the city average and energy burdens exceeding 10% of household income.

The Renewable Rikers project offers the potential to reverse decades of environmental harm by displacing waterfront infrastructure and expanding green and public-access spaces. By relocating WRRF operations from existing South Bronx and Upper East River sites to Rikers, the City can significantly reduce truck traffic and air emissions in residential zones. The resulting improvements in local air quality could yield measurable public health benefits, including reduced asthma hospitalizations and premature mortality (McCunney, 1986).

From a socioeconomic standpoint, the project is expected to generate thousands of construction and permanent operations jobs. Ensuring equitable access to these opportunities requires deliberate planning and coordination with workforce

development organizations. Embedding local hiring mandates and apprenticeship pathways will ensure that economic benefits accrue directly to disadvantaged communities. Such programs could be modeled on successful initiatives like the Los Angeles Clean Water Program, which integrates EJ hiring standards into capital projects (CEG, 2025).

Resiliency extends beyond physical infrastructure to encompass social systems and adaptive capacity. Incorporating community ownership in renewable energy generation can enhance local resilience and long-term sustainability. Research by Garcés-Gómez et al. (2021) demonstrates that participatory renewable energy systems improve both energy equity and social cohesion, reinforcing the importance of co-design principles in major infrastructure planning.

Finally, environmental health risk mitigation must be institutionalized. As wastewater treatment exposes workers to biological and chemical hazards, comprehensive occupational safety standards and medical surveillance programs are essential. The Renewable Rikers project should establish a precedent for integrating occupational health, climate adaptation, and equity within a unified governance framework.

ECONOMIC AND WORKFORCE IMPACTS

The proposed Rikers Island WRRF is expected to generate substantial construction, trades, engineering, and operations employment over its multi-decade lifecycle—on the order of several thousand jobs (DEP, 2024). While the publicly released DEP Feasibility Study does not provide a firm employment estimate for the project, comparable large-scale wastewater and climate-infrastructure projects offer reasonable benchmarks. With a projected capital cost of approximately \$34 billion, standard U.S. infrastructure multipliers (e.g., ~10 jobs per \$1 million in capital investment during peak construction) suggest a total construction impact of roughly 300,000–350,000 job-years, translating into an estimated 3,000–5,000 peak construction jobs on site. Peer projects—such as Boston’s Deer Island Treatment Plant upgrade, Los Angeles’ Hyperion Biosolids Modernization, and Singapore’s Deep Tunnel Sewerage System (DTSS)—similarly employed several thousand construction workers during build-out phases. For ongoing operations, global facilities of comparable size typically employ 500–1,500 permanent operators, engineers, technicians, electricians, and maintenance staff, depending on automation and energy-recovery systems. Together, these estimates indicate that the Rikers Island WRRF would be one of the most significant green-infrastructure job creators in New York City’s history.

Comparable international wastewater megaprojects demonstrate that facilities of similar scale and complexity typically support several thousand construction jobs during peak build-out phases and employ hundreds to more than a thousand workers in long-term operations. The table below summarizes job impacts from these peer projects, reinforcing that a “several thousand jobs” estimate for the Rikers WRRF is both reasonable and consistent with global precedent.

EMPLOYMENT IMPACTS OF COMPARABLE LARGE-SCALE WRRF AND INFRASTRUCTURE PROJECTS

PROJECT	LOCATION	CAPITAL COST	PEAK CONSTRUCTION JOBS	PERMANENT OPERATIONS STAFF	NOTES / SOURCE
Deer Island Treatment Plant Modernization	Boston, MA	~\$3.8B (1990s \$, ~\$7B today)	~5,000	~400–450	Major modernization and consolidation (MWRA, 2000)
Hyperion WRRF Digester & Biosolids Modernization	Los Angeles, CA	~\$2B	2,000–3,000	~850–900	Advanced digestion & biogas systems (LASAN, 2021)
Deep Tunnel Sewerage System (DTSS) Phase I & II	Singapore	~\$10B+	~5,000	~750–1,200	Centralized WRP & tunnels (PUB Singapore, 2020)
Thames Tideway Tunnel	London, UK	~\$5.5B	~4,000	No major change	Large CSO control tunnel (Tideway, 2019)
Ashbridges Bay Treatment Plant Upgrades	Toronto, Canada	~\$3.2B CAD	1,500–2,000	~500–700	Capacity & resilience expansion (Toronto Water, 2021)

Summary of job impacts from major wastewater and water infrastructure megaprojects that provide useful benchmarks for estimating the potential workforce associated with the proposed Rikers Island WRRF.

OCCUPATIONAL HEALTH, SAFETY, AND MEDICAL SURVEILLANCE IN OPERATIONS

Occupational health and safety are critical—yet often underrecognized—components of wastewater treatment operations. As New York City considers consolidating four major WRRFs into a singular, larger, and more technologically advanced facility on Rikers Island, the scale and complexity of the workforce's exposure profile will increase. This warrants a clear articulation of best practices, emerging risks, and opportunities for systemwide improvements (Kane & Tomer, 2018).

New York City's current WRRFs follow standard safety protocols aligned with OSHA and NYC Department of Environmental Protection guidance. Typical baseline practices include respiratory protection programs for aerosolized pathogens, chemical vapors, and biosolids dust; confined space entry protocols per OSHA 29 CFR 1910.146; and lock-out procedures for pumps, blowers, centrifuges, and electrical systems. Personnel also rely on the availability of PPE—such as N95s or half-mask respirators, gloves, chemical-resistant suits, eye protection, and steel-toed boots—and receive hazard communication and chemical exposure training. Medical surveillance programs typically provide annual physicals, vaccinations, limited bloodborne pathogen monitoring, and include respiratory fit testing and hearing conservation where applicable (U.S. EPA, 2024).

While these measures meet minimum regulatory requirements, high-capacity WRRFs such as the proposed Rikers facility introduce new risk categories not fully accounted for in existing systems. Larger influent volumes and advanced treatment trains—including MBR, high-rate grit removal, and energy recovery processes—increase potential exposure to:

- » Bioaerosols containing viruses, bacteria, protozoa, and fungi
- » Higher concentrations of wastewater-borne pathogens such as norovirus, Legionella, Leptospira, and antibiotic-resistant organisms
- » Anaerobic digestion hazards, including methane pockets, hydrogen sulfide, and siloxane particulates

Climate-adaptive infrastructure may further elevate risks related to work on elevated or flood-resistant structures, post-storm recovery operations, heat stress in membrane treatment buildings and blower rooms, and slips, trips, and falls across larger tunnel networks and pump galleries.

Across U.S. and international WRRFs, best-in-class occupational health programs incorporate comprehensive medical surveillance—such as pre-employment and annual screenings tailored to exposures, dental surveillance for metal fume

and chemical risk, spirometry, blood monitoring for heavy metals and VOC markers, immunizations aligned with wastewater pathogen risks, and structured post-exposure tracking (Williams, 2020). Advanced facilities globally (e.g., Toronto, Rotterdam, Singapore) also utilize real-time monitoring technologies, such as continuous hydrogen sulfide sensors, portable VOC detectors, particulate and bioaerosol monitoring, and automated ventilation controls. Increasingly, high-volume WRRFs also integrate fatigue, shift-work, and mental-health support programs as part of holistic worker safety (Zakiya, 2019).

In conclusion, the proposed Rikers Island WRRF presents a rare opportunity for New York City to establish a new benchmark for occupational health and safety across the wastewater sector. The scale and complexity of this facility, combined with the convergence of biological, chemical, climate-related, and energy-related hazards, make it an ideal pilot site for a comprehensive

safety and medical surveillance program that exceeds current norms. By implementing real-time exposure monitoring, enhanced training, and standardized medical surveillance protocols at Rikers—and ultimately extending these practices to all WRRFs—NYC can create a citywide model that safeguards workers, strengthens workforce readiness, and modernizes operational standards (U.S. Water Alliance, 2017). Because frontline WRRF roles are disproportionately held by lower-income workers, workers of color, and residents of environmental justice communities, adopting stronger protections also represents an ethical commitment to equity (Kane & Tomer, 2018; U.S. Water Alliance, 2024). With coordinated partnerships across labor unions, workforce development programs, and city agencies, NYC can leverage the Rikers WRRF as a demonstration site that elevates safety expectations, informs future upgrades, and positions the city as a national leader in resilient, worker-centered wastewater management.

COMMUNITY IMPACT AND PUBLIC ENGAGEMENT

Community engagement is not ancillary to Renewable Rikers—it is a defining feature of its success. The legacy of exclusion from environmental decision-making in affected neighborhoods underscores the need for participatory governance. NYC-EJA and its Renewable Rikers coalition partners can lead this process by convening structured dialogues, stakeholder workshops, and youth-centered educational initiatives.

To foster informed participation, the creation of accessible, multilingual educational materials is essential. Story maps, data dashboards, and public visualization tools can translate complex technical data into meaningful information for residents. Such approaches have proven successful in cities like Portland and Toronto, where community monitoring of wastewater and air-quality metrics has increased public trust and accountability.

The establishment of a Renewable Rikers Community Advisory Council would institutionalize this engagement, ensuring that residents have a formal mechanism to shape design, contracting, and workforce priorities. The Council should include representation from Bronx and Queens community boards, EJ organizations, and youth leadership groups to ensure diverse and sustained participation.

Furthermore, the City should collaborate with the Renewable Rikers coalition, local colleges and workforce development institutions to create training programs aligned with the project's technical needs. By building local capacity in fields such as wastewater management, renewable energy, and environmental monitoring, the City can cultivate the next generation of climate infrastructure professionals drawn from the communities most affected by inequity.

Public engagement also requires transparency in data sharing. The City should adopt open data protocols for WRRF operations, energy performance, and emissions metrics. Real-time publication of this information can serve as a community accountability mechanism and demonstrate adherence to climate and equity commitments.

POTENTIAL BENEFITS FOR WATER QUALITY IMPROVEMENT

Improved water quality around Rikers offers a multitude of benefits for East River ecology, as well as community health and accessibility to nature. Tidal wetlands are an important part of the East River, providing barriers for storm surge, improving water quality, and serving as critical sites for fish reproduction. Pollution and poor water quality impact a wetland's assimilative capacity or ability to perform these essential ecosystem functions, resulting in degradation - may be seen as algal bloom prevalence or fish kills (Convention on Wetlands, 2022; UNDRR, 2025). The provision of improved water quality, by reducing CSO effluent and increasing wet weather capacity to thoroughly treat wastewater, through the Rikers WRRF establishes conditions that communities can continue to leverage for stewardship, environmental education, and shoreline access (Dar et al., 2022). Example initiatives include saltmarsh restoration by [Randalls Island Park Alliance](#), waterfront park development for boating and fishing by the [Hunters Point Community Coalition](#), and public access/open water swim programs by the Hudson River Foundation's [Public Access Work Group](#) (+Pool is a resulting project).

Broader Public Health benefits include:

- » Odor control
- » Reduced contaminant concentrations in seafood
- » Lower risk of recreational exposure to pollutants
- » Public welfare via inclusive recreation for mental health and heat wave mitigation

SUMMARY OF CONCLUSION, FINDINGS AND RECOMMENDATIONS

This independent analysis confirms the technical feasibility and transformative potential of the Renewable Rikers initiative. To maximize its benefits and minimize risks, the following recommendations are advanced:

- » First, the City should adopt a modular construction approach, beginning with the 135-acre core configuration to accelerate implementation. Phased deployment allows for adaptive learning and incremental integration of renewable systems while delivering early public health and economic benefits.
- » Second, renewable energy systems—including solar photovoltaics, and battery storage—should be fully integrated into facility operations. Energy self-sufficiency will enhance resilience and reduce long-term operational costs. However, it is strongly recommended that there be a more rigorous evaluation and expanded modeling to incorporate compost processing and co-digestion scenarios (a preliminary analysis is included in the Appendix).
- » Third, governance mechanisms must embed transparency and equity. Establishing a Renewable Rikers Advisory Council, formalizing community oversight, and publishing quarterly progress reports will institutionalize accountability.
- » Fourth, workforce and contracting policies should codify local hiring mandates and small

business participation goals, ensuring that the economic benefits of Renewable Rikers extend directly to historically marginalized communities.

- » Fifth, subsequent planning phases should include a detailed jobs-and-workforce assessment, with disaggregation by construction trades, engineering, operations, and maintenance roles, and with specific attention to local hiring, apprenticeship access, and equitable workforce pathways for environmental justice communities.
- » Finally, the City should position Renewable Rikers as a model for just transition, linking environmental remediation, infrastructure renewal, and social equity. With deliberate implementation, the project can redefine how major capital investments align with environmental justice.

Renewable Rikers represents both a technical challenge and a moral imperative. The findings demonstrate that the consolidation of wastewater infrastructure on Rikers Island is feasible, cost-effective, and capable of delivering measurable climate and equity benefits. Its success will depend on sustained collaboration among city agencies, community organizations, and technical experts. By embedding transparency, adaptability, and justice into its core, Renewable Rikers can stand as a national exemplar of sustainable urban transformation.

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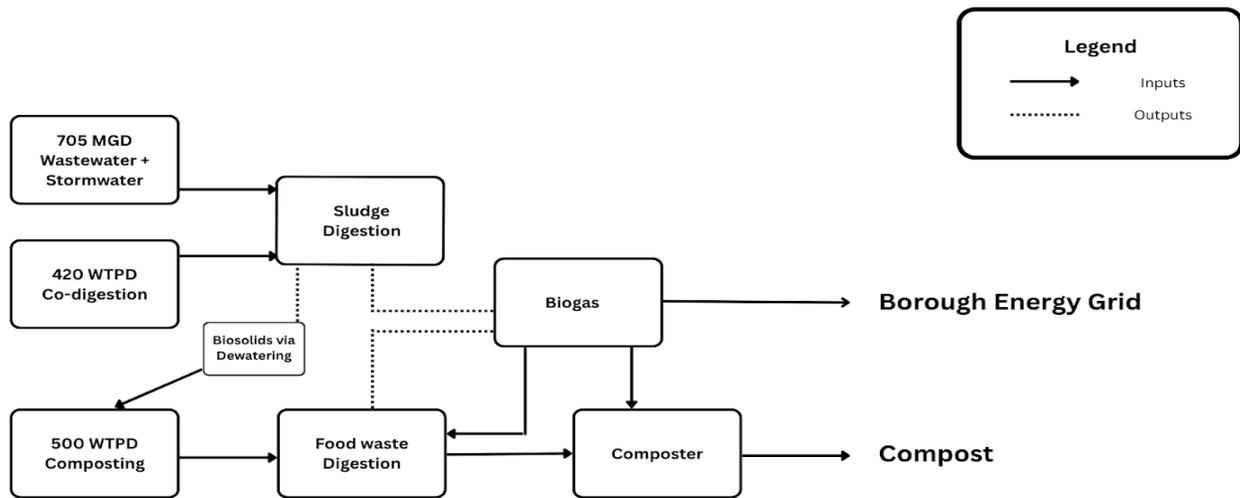
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APPENDIX

PART 1: EXPANDED MODELING TO INCORPORATE 500 WET TONS/DAY COMPOST PROCESSING AND 420 WET TONS/DAY CO-DIGESTION SCENARIOS

Diagram showing expanded modeling that incorporates 500 wet tons/day compost processing and 420 wet tons per day co-digestion. The outputs are biogas for the NYC energy grid and compost for city-wide agricultural projects⁴⁷.



47. NYC-EJA Editorial Footnote: A carefully designed anaerobic digestion program can also help decarbonize hard-to-electrify operations around the city, such as industrial or aviation operations near Rikers Island. However, NYC-EJA does have concerns about ongoing failures in DEP's biogas program at Newtown Creek WRRF and about extending biogas distribution to households and small businesses via the energy grid.

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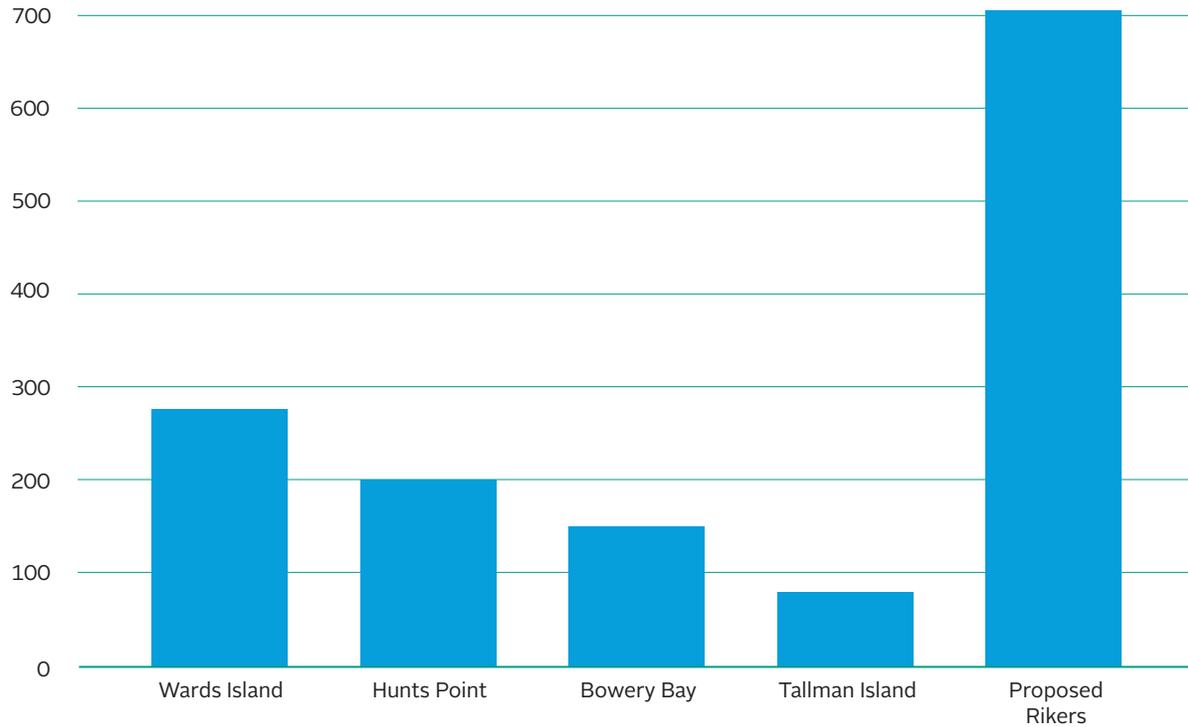
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PART 2: COMMENTARY ON THE APPROPRIATENESS OF THE PROPOSED WRRF CAPACITY

WRRF CAPACITY AND CSO REDUCTION ANALYSIS

Proposed Rikers Island WRRF capacity relative to existing flows and projected CSO reductions.

WRRF AVERAGE FLOW COMPARISON



WRRF	AVG FLOW (MGD)	PEAK FLOW (MGD)
Wards Island	275	~550
Hunts Point	200	~400
Bowery Bay	150	~300
Tallman Island	80	~160
Proposed Rikers	705	1410

COMPARABLE CASE STUDIES

Tunnel and Reservoir Plan (TARP) (Chicago)

<https://mwr.org/what-we-do/tunnel-and-reservoir-plan-tarp>

Deer Island / Massachusetts Water Resources Authority (Boston)

<https://www.mwra.com/your-sewer-system/sewer-treatment-facilities/deer-island-wastewater-treatment-plant>

Deep Tunnel Sewerage System (DTSS) (Singapore)

<https://www.pub.gov.sg/Professionals/Requirements/Used-Water/DTSS>

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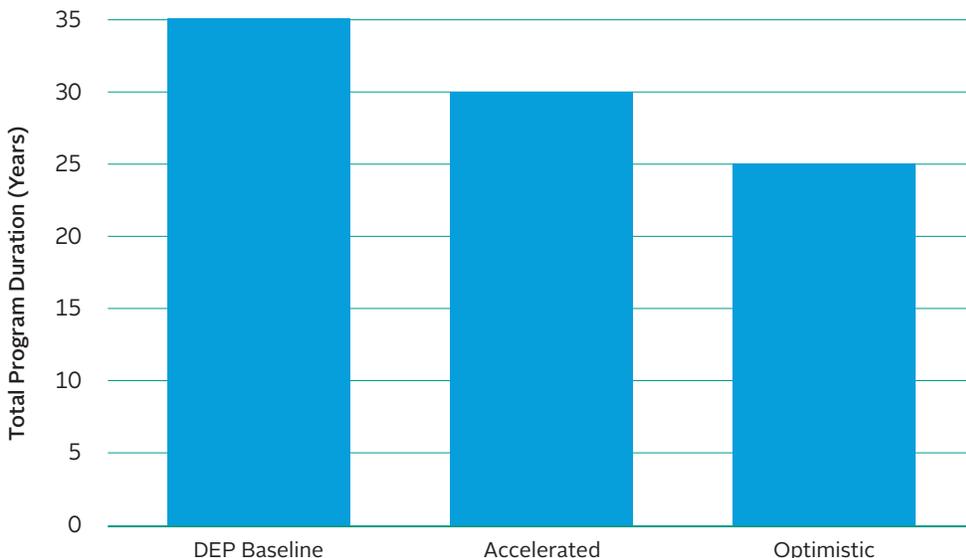
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PART 3: CLARIFICATION OF TIMELINE AND POTENTIAL ACCELERATION OPPORTUNITIES

SUMMARY/ASSESSMENT OF VALIDITY: TIMELINE SCENARIO COMPARISON

The DEP's feasibility study outlines an approximately 35-year program timeline, which includes 10 years of planning, permitting, and design work, followed by 25 years of phased construction and commissioning. Our independent analysis identifies opportunities for schedule acceleration. If planning and design phases overlap with early site preparation and modular construction is adopted, a 30-year scenario becomes feasible. Under highly optimized conditions—including early site access following jail closure, fast-tracked permitting, and prefabricated WRRF process trains—the timeline could be reduced further to approximately 25 years.

TIMELINE SCENARIO COMPARISON



PART 4: JOB PROJECTIONS BASED ON SIMILAR LARGE SCALE WRRF AND INFRASTRUCTURE PROJECTS

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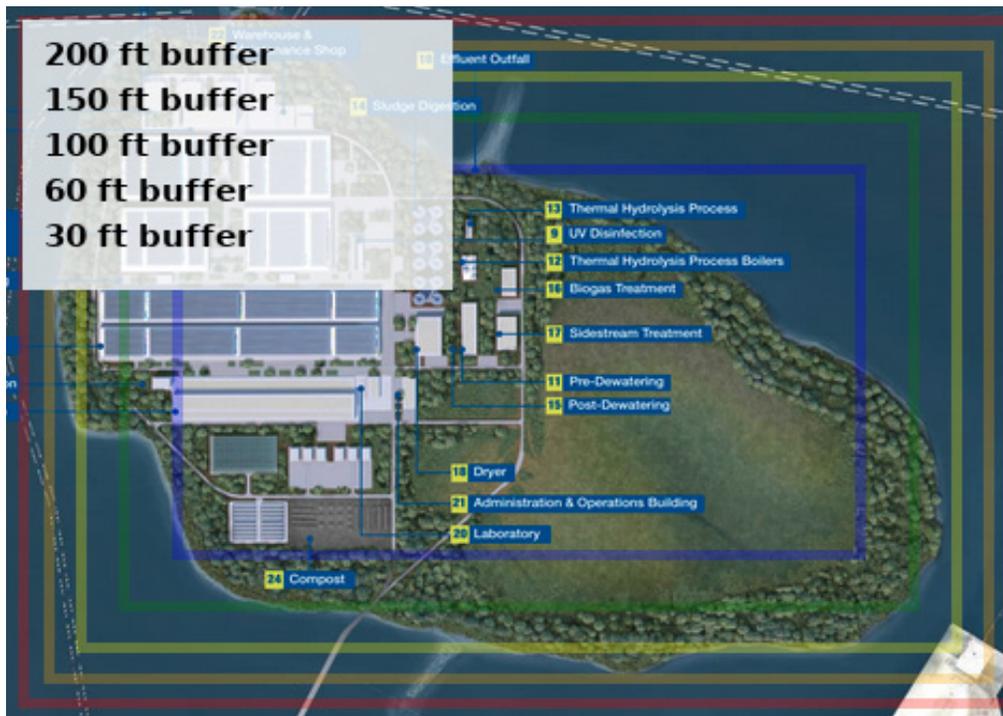
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PART 5: REQUIRED RESILIENCY ELEMENTS

ORIGINAL SITE PLAN FROM DEP'S FEASIBILITY STUDY

In the following image, colored bands have been layered directly onto the original site plan. Each band represents a resiliency buffer width (30 ft, 60 ft, 100 ft, 150 ft, 200 ft). Although distances are approximate, the overlay visually demonstrates how expanding buffers compress the buildable WRRF footprint, reducing acreage available for:



- » Solar PV
- » Battery storage
- » Composting and co-digestion
- » Administrative and support buildings

The above overlay now clearly shows:

- » How resiliency buffers compress available acreage
- » Where shoreline retreat and coastal protection would likely occur
- » Which parts of the WRRF site layout would be impacted first
- » The visual trade-off between infrastructure footprint and resiliency layer depth

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U.S. Army Corps of Engineers (USACE). (2020). *Engineering with Nature: Coastal resilience and shoreline stabilization guidelines*.

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Water Research Foundation. (2022). *Resilience planning for water and wastewater utilities: Backup power, redundancy, and adaptive design*.

ANNOTATED CITATIONS RELATED TO PART 5

Berms / Levees (30–90 ft width; needed for 3–6 ft SLR + surge)

Berm and levee dimensions in coastal wastewater and industrial facilities typically range from 30–100 ft to accommodate projected sea-level rise and storm surge loading (USACE, 2022; NYC DEP, 2020).

Vegetated Buffers (30–100 ft)

Vegetated dune buffers and treeline windbreaks are recognized as effective energy dissipation zones, with standard widths between 30 and 100 ft depending on wave climate and shoreline slope (FEMA, 2015; NOAA, 2022).

Floodable / Sacrificial Zones (1–5 acres)

EU coastal WRRFs and flood-resilient utilities incorporate “sacrificial” floodable zones ranging from 1 to 5 acres to absorb surge and protect mechanical systems (Garcés-Gómez et al., 2021; European Commission, 2020).

Shoreline Stabilization (Riprap or Living Shoreline: 50–200 ft)

Living shoreline and hybrid stabilization designs generally require 50–200 ft, depending on erosion risk, bathymetry, and storm wave exposure (NOAA, 2021; USACE, 2020).

Redundant Power Systems + Elevated Substations (1–3 acres)

Climate-resilient wastewater facilities increasingly rely on redundant power systems, backup generators, and elevated substations that require 1–3 acres depending on battery storage, transformer needs, and NFPA-70 compliance (EPA, 2024; Water Research Foundation, 2022).

Global Best Practices for WRRF Resiliency

Resiliency layers such as berm buffers, shoreline retreat, and elevated systems are standard in advanced coastal WRRFs in Rotterdam, Toronto, Singapore, and Copenhagen (Garcés-Gómez et al., 2021; Edwards et al., 2023)



EXPANDED COMPOSTING FACILITY

Eric A. Goldstein

The City Council's original vision for Renewable Rikers included not only battery storage, a solar array, and a modern wastewater treatment plant, but a major expansion of composting on the island as well. (For three decades, the City has operated a small Rikers Island composting facility to sustainably process food scraps and yard waste generated on the island.) Local Law 17 of 2021 required the City to study "the potential for organics waste recycling via composting operations..." as part of a Renewable Rikers Island. One conclusion of the resulting March 2024 NYC Department of Environmental Protection study was that a new Rikers Island composting facility could be "significantly expanded from the current one acre operation... with the ability to process 500 wet tons per day using technology similar to what DSNY currently uses at other newer composting facilities."

There would be many advantages to New York City from creating additional in-city compost processing capacity on Rikers Island. For one, such an operation would provide the NYC Department of Sanitation with the ability to turn the organics collected at curbside from city residents into finished compost – an end-product that could be used to replace chemical fertilizers, as a natural soil stabilizer, and to help make city green spaces, street trees, and household gardens and plants healthier. Importantly, a composting facility could also have significant environmental justice benefits. A major Rikers Island composting facility could enable the City to divert organics that are currently being collected in Manhattan from being sent to the problem-plagued Essex County incinerator in Newark, NJ; this incinerator is a localized source of air pollution in an already overburdened community and its emissions are often carried across the Hudson River back into Manhattan with prevailing winds. Beyond that, an expanded composting operation on the island could become a hub for new green jobs and worker training for city residents, including former Rikers detainees.

An expanded Rikers Island composting facility would have to be sited properly and sized so as not to interfere with plans for the modern wastewater resource recovery facility and renewable energy infrastructure on the island. The composting operation would have to be constructed with resilience measures in mind, so that it would not be vulnerable to the rising seas expected in the decades to come.

The benefits of expanding the City's composting capacity on Rikers Island are too important to overlook. The work to construct a new composting facility on the island could begin relatively quickly, even before the complete end to incarceration on the island, creating momentum for all the other changes we want to see happen at this notorious jail complex.

CONCLUSION



Reimagining and developing Rikers Island from its current dysfunctional state to a hub of sustainable infrastructure and restorative justice is a once-in-a-generation opportunity for New York City that needs attention and action now. Actions taken toward this goal by the City administration in the coming months and years can have several compounding benefits for the criminal legal system, our climate goals, and environmental justice communities in the decades to come. One key action that the Mamdani administration can take in the first 100 days is to commit to transferring underutilized parcels of land and jails from the jurisdiction of the Department of Correction (DOC) to the Department of Administrative Services (DCAS), in line with the Renewable Rikers Act.

The City's own feasibility studies acknowledge that Rikers Island can and should be used for critically needed renewable energy, wastewater infrastructure, and composting that would serve New Yorkers in the decades to come.

The Department of Environmental Protection's feasibility study states "*Constructing a new WRRF on Rikers Island is not only feasible; it would expand and tremendously improve wastewater treatment and resource recovery operations in New York City.*"⁴⁸ Similarly, the city's renewable energy feasibility states that "*given the extreme shortage of available land in New York City's densely populated urban environment, harnessing hundreds of acres of available buildable land presents a good opportunity to help achieve the State's and City's clean energy goals.*"⁴⁹

With this report, we want to illuminate the opportunities for investment on Rikers Island and help the incoming Mamdani administration build momentum by providing pathways to pursue. Having lost progress during the last four years, we now reiterate the importance of building staffing and funding capacity of relevant agencies to begin

master planning for the Island and developing the coordination practices that are necessary to speed up the proposed 40-year timeline. We reaffirm the recommendation from the Renewable Energy, Wastewater and Composting chapters to develop a Renewable Rikers Taskforce to be a liaison with the City and oversee key pieces of the master plan development and implementation to make the project a reality.

NYC-EJA and the Renewable Rikers coalition recognize the important role New York State and the Federal government can play in creating the conditions for regulation and providing incentives that either push forward this project or slow it down. As with many key recommendations from the research teams, the time to act is now. There is a critical need to take advantage of existing funding sources while they last and simultaneously chalk out plans for future funding.

The benefits of Renewable Rikers and our transition to renewable energy are numerous and can help the City and State meet their climate goals and improve the quality of life. New York City's ongoing dependence on fossil fuels disproportionately harms low income communities and imposes physical, mental, and financial costs on our most vulnerable residents. The same New Yorkers who are struggling with public health exposures such as pollution and flooding are also paying additional costs that come with the climate crisis and our reliance on noxious fossil fuel infrastructure. With a vision like Renewable Rikers, New York City has the potential to change the status quo of our fossil fuel reliance which in turn can save residents millions in avoided healthcare costs annually. With added state-of-the-art wastewater infrastructure on Rikers, it can in part help address the flooding that New Yorkers already experience and improve water quality in the waters around the island. This report can serve as a north star for how the Renewable Rikers vision can progress under this Mayoral administration and those to come.

48. Feasibility Study for a New Wastewater Resource Recovery Facility on Rikers Island, page 9.

49. Renewable Rikers Feasibility Study Report, page 37.



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