



Local Law 1 Report December 2018



Energy

NYC
DCAS
Citywide Administrative
Services



About DCAS

The Department of Citywide Administrative Services (DCAS) provides value-added and effective shared services to support the operations of New York City government. Its commitment to equity, effectiveness, and sustainability guides its work with City agencies on recruiting, hiring, and training employees; providing facilities management for 55 public buildings; acquiring, selling, and leasing City property; purchasing more than \$1 billion in supplies and equipment each year; and implementing conservation and safety programs throughout the City's facilities and vehicle fleet.

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About DCAS Energy Management

The DCAS Division of Energy Management is at the forefront of the City's energy conservation and sustainability efforts. It oversees more than 10,000 utility accounts for City government agencies across 4,000 public buildings. It implements creative solutions to reduce energy consumption, promote energy efficiency in public buildings, and to generate clean energy on City-owned properties. The Division manages a \$700 million annual energy supply budget and a \$2.7 billion 10-year capital budget to develop and implement programs to achieve the City's One City: Built to Last strategy of an 80% reduction of greenhouse gas emissions by 2050.

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Cogeneration (“Cogen”)

Cogeneration describes the process of producing electrical power, while simultaneously recovering and utilizing heat (thermal energy). Cogen installations are suitable for facilities that consume electric and thermal energy at relatively consistent levels throughout the day and the year. Cogeneration is also known as “combined heat and power,” or “CHP.”

Cogeneration Installations

In the context of this report, Cogeneration installations, as compared to Distributed Generation installations, are defined as installations where both electrical power and heat are being produced on-site.

Distributed Energy Resources (“DER”)

Distributed energy resources are energy supply sources that include Cogen, DG, solar PV, battery storage and other energy efficiency measures.

Distributed Generation (“DG”)

Distributed generation describes an approach to power generation, whereby small-scale technologies are used to produce electricity close to end users.

Distributed Generation Installations

In the context of this report, Distributed Generation installations, as compared to Cogeneration installations, are defined as projects where only electrical power is being produced on-site. DG installations have been grouped into two subcategories: those focused on supporting peak load shaving, or reducing load from the grid during peak demand periods, and those focused on supporting continuous operations, or reducing load from the grid on an ongoing basis.

Covered Facilities

Covered Facilities are City-owned facilities that meet the requirements for coverage by Local Law 1 of 2007, meaning that they have exhibited a peak electrical demand of at least 500 kilowatts (kW) in the last Calendar Year.

Load Factor

Load factor measures the ratio of average energy demand relative to peak energy demand, expressed as a percentage.

Recommended Facilities

Recommended facilities are Covered Facilities that have been identified as high-potential facilities for Cogen or DG installations, based on analysis conducted under the requirements of Local Law 1, and are suggested to receive further site-specific analysis.

Simple Payback

Simple payback measures the amount of time that it takes an energy project to recover its upfront installation costs based on its annual energy cost savings. The metric is calculated by dividing the upfront project installation cost by annual energy savings and is expressed in years. Simple payback does not include other cost factors, such as operations and maintenance costs or utility standby charges, and is not discounted to reflect the time value of money.

Executive Summary

Local Law 1 of 2007 (“LL1”) requires the Department of Citywide Administrative Services (“DCAS”) to assess all City-owned facilities with a peak electric demand of at least 500 kilowatts (“kW”) for their potential to accommodate “certain clean on-site power generation technologies,” namely “Cogeneration and natural gas-based Distributed Generation projects.”¹ LL1 defines these installations as projects where “electric generation would be connected to the distribution level of the grid [and] would be located at or near the intended place of use.” In the context of this report, Cogeneration (“Cogen”) installations are defined as installations where both electrical power and heat are being produced on-site, and Distributed Generation (“DG”) installations are defined as installations where only electrical power is being produced on-site. The last LL1-required assessment was completed in 2013. To complete this 2018 assessment (“Assessment”), DCAS’s Division of Energy Management (“DEM”) commissioned consultants consisting of John-Winston Engineers & Consultants, Inc. (“JWE”) and Couch White, LLP (“CW,” collectively “the Consultant Team”).

For this Assessment, DCAS evaluated Cogen and DG feasibility at 388 City-owned facilities (“Covered Facilities”). For the core analysis, DCAS used a tool developed by the United States Department of Energy (“U.S. DOE”) and NYSERDA CHP TAP² to evaluate the economic feasibility of installation projects using simple payback. DCAS also used a weighted scoring methodology developed by JWE to evaluate the technical feasibility of all facilities for three types of installations. These installation types were Cogen installations, DG installations focused on enabling peak load shaving, and DG installations focused on enabling continuous operations. Based on the resulting scores, facilities were rank-ordered according to their suitability for the three different installation types.

Out of the 388 Covered Facilities, 87 were identified as having a simple payback within the threshold considered economically feasible in the context of this report (i.e., not exceeding 15 years) using the U.S. DOE tool. Within the 388 Covered Facilities,

based on the application of the weighted scoring methodology:

- 16 facilities were identified as high-potential for Cogeneration installations. These facilities generally comprise hospitals and campus-style facilities, such as colleges and water resource recovery facilities. They have consistent electric and thermal load profiles that allow for continuous Cogen operation at or close to full capacity.
- 15 facilities were identified as high-potential for DG installations focused on supporting peak load shaving. These facilities generally are campuses or hospitals with central electric services. They have low summer electric load factors that enable reductions in utility infrastructure demand during peak load season through peak shaving techniques.
- 11 facilities were identified as high-potential for DG installations focused on supporting continuous operations. These facilities generally are campuses or hospitals. They have high annual electric load factors that enable continuous operation of a central electric plant at or close to full capacity.

In total, out of the 388 Covered Facilities, seven facilities were identified as high-potential facilities for all three types of installations. The seven facilities included the center campuses for Bellevue Hospital, Brooklyn College, Harlem Hospital, Kings County Hospital, Gouverneur Health Care Services, City College of New York, and Jacobi Medical Center. Out of these seven facilities, three facilities, Bellevue Hospital, Jacobi Medical Center, and Brooklyn College, were recommended within the 2013 LL1 assessment as high-potential locations for Cogen or DG implementation. Plans for cogeneration are being advanced at two of these facilities, as discussed in the **Study Findings** section.

¹ LL1 mandates assessment of city facilities regarding certain clean on-site power generation technologies.

² New York State’s Energy Research and Development Authority’s Combined Heat and Power Technical Assistance Program

To supplement the core analysis of Cogen and DG installation feasibility, DCAS also conducted a follow-up analysis to identify facilities that might be suitable sites for installations based on the facilities' potential to support specific socio-economic benefits. The specific benefits considered were the capability to support significant greenhouse gas emission reductions and the capability to support enhanced facility resilience. In the context of this assessment, emission savings were evaluated against capital investment for a Cogen facility.³ In the context of this report, resilience was defined as the ability to maintain uninterrupted power flow during interruptions to grid-supplied power. To identify facilities where this functionality is essential, DCAS identified "critical infrastructure" facilities that are required to maintain uninterrupted power flow to support life and safety measures: namely police stations, fire stations, hospitals, nursing homes, emergency shelters and water resource recovery facilities. In contrast to Cogen and DG installations at other facilities, where the minimum threshold for projects to be considered economically feasible was a simple payback of 15 years or fewer, Cogen and DG installations at "critical infrastructure"⁴ facilities were considered economically viable if they had a simple payback period not exceeding 25 years. Of the 388 Covered Facilities, 40 facilities were recommended for resilience-based Cogen and DG installations.

Since the original passage of LL1 in 2007, the energy landscape within New York State has changed due to several factors. These factors, which include reductions in the carbon intensity of the grid, the City's deployment of a broader range of strategies to achieve emissions reductions, the expansion of solar PV installations on City properties, and the growing policy imperative for resilience, have altered the relative value of Cogen and DG installations for the City. In the Further Considerations section, DCAS identifies the opportunity to realize greater value from future assessments of Cogen and DG viability at City properties and recommends incorporating the core provisions of LL1 into Local Law 248 of 2017 ("LL248"). Since LL248 requires the City to periodically produce Long-Term Energy Plans, this change would result in such assessments being integrated within the holistic

framework of the Long-Term Plans. Implementation of this recommendation would eliminate the current overlap that exists between the two bills and enable the City to consolidate its energy supply-related investigations.

³ Cogen can produce emissions reductions because it also produces thermal energy. DG, which only produces electricity, and does so less efficiently than a grid-scale plant, will not have any emissions reductions.

⁴ "Microgrids for Critical Facility Resilience in New York State". NYSERDA. 2014.

Study Context and Introduction

LL1 requires DCAS to assess all City-owned facilities with a peak electric demand of at least 500 kilowatts (“kW”) for their potential to accommodate “certain clean on-site power generation technologies,” namely “Cogeneration and natural gas-based Distributed Generation projects.” LL1 defines these installations as projects where “electric generation would be connected to the distribution level of the grid [and] would be located at or near the intended place of use.” The assessment is “required to include, but is not limited to, an analysis of the technical, physical, and/or economic feasibility” of such installations.

For this study, the relevant installations have been grouped into two categories: Cogen installations, defined in the context of this report as installations where both electrical power and heat are being produced on-site, and DG installations, defined in the context of this report as installations where only electrical power is being produced on-site. Typically, facilities that are suitable for Cogen installations consume electric and thermal energy at relatively consistent levels throughout the day and the year, and have a greater thermal load relative to electric load. In contrast, facilities that are suitable for DG installations tend to be multi-building campuses that do not have a need to reuse wasted heat, but benefit from on-site electric generation. Relative to facilities that are suitable for Cogen installations, these facilities generally also have a higher electric to thermal load.

Depending on the manner in which they are deployed, both Cogen and DG installations have the potential to offer important economic, technical, and socio-environmental benefits. These benefits include, but are not limited to, the following:

Technical benefits

- Reduced energy demand burden on existing utility infrastructure: Cogen and DG installations enable facilities to reduce their energy demand on existing utility infrastructure on both an ongoing basis and during peak demand periods and emergency situations.

- Increased energy production efficiency through reduced line losses: By enabling power to be generated at or near the site of end use, Cogen and DG can reduce line losses associated with electricity being transported over large distances.

Economic benefits

- Cost savings associated with reductions in overall and peak energy demand: By curbing facilities’ load, especially during periods of peak energy demand when energy prices are highest, Cogen and DG installations can help facilities reduce their energy costs.
- Revenue generation associated with “buyback” transactions or gains from distributed energy resource tariffs: Cogen and DG installations can generate “surplus” power that can be transmitted back into the electric grid for redistribution. Facilities are compensated for supplying the grid with power in a “buyback” transaction.

Socio-environmental benefits

- Emissions reduction benefits: By recycling wasted thermal energy to generate needed power, as opposed to generating new power from non-renewable, carbon-intensive energy sources, Cogen installations can help reduce emissions.
- Resilience benefits, in terms of maintaining uninterrupted power flow during emergency situations: If Cogen and DG installations are functional without grid supply (islanded operations) during system outages, they can maintain uninterrupted power flow during emergency situations.

When City Council passed LL1 in 2007, the City was developing PlaNYC, its first major sustainability plan. PlaNYC included 30x17, an ambitious commitment to reduce emissions generated from municipal operations 30 percent by 2017 from Fiscal Year 2006 levels. To meet the City's emissions reduction target, as well as provide "cleaner and more reliable power," City policymakers began exploring strategies to reduce the City's reliance on non-renewable energy sources that comprised part of the electric grid mix.⁵ LL1, which mandated investigation of Cogen and DG for larger City facilities, was passed as part of this effort. While City policymakers recognized the ability to realize multiple benefits from Cogen and DG installations, LL1 itself reflected a strong focus on using such installations to achieve emissions reductions. This policy focus is evidenced by the fact that LL1 includes an explicit requirement that installations "produce fewer emissions of carbon dioxide and particulate matter per unit of useful energy output than a new combined-cycle natural gas-fired central power plant." The specification of "particulate matter" acknowledges the link between emissions reductions and airborne pollutant reductions.

Since the original passage of LL1 in 2007, there have been significant changes in the energy landscape within New York State that have affected the economic and socio-environmental value of Cogen and DG, with attendant implications. First, the carbon intensity of the electric grid has declined by 45 percent since 2007, reducing the potential emissions reduction benefit associated with using less grid electricity.⁶ The decrease in grid carbon intensity is due in large part to the reduction of coal and oil-fired electric generating units.⁷ Further, given the implementation of New York State's Renewable Energy Standard, which will mandate for 50 percent of the energy consumed in the state to come from renewable generation by 2030, the carbon intensity of the grid will continue decreasing, although further reductions may be impeded by the closure of Indian Point Energy Center. Given the changing carbon intensity of the grid, the City will continue to monitor the anticipated emissions reductions benefits of Cogen electricity as compared to grid electricity in order to ensure that Cogen installations continue to offer emissions reductions benefits during their expected useful life. This exercise will require projecting the future carbon intensity of the grid over the expected useful life of such assets.

Second, as the City has increased its emissions reductions targets over time, including by adding the 80x50 and 40x30 goals, the City has broadened its strategies to achieve such reductions.⁸ For example, in recent years, DCAS has introduced Demand Response and Load Management programs to cut load both during peak demand periods and on an ongoing basis through operational improvements. The City also has scaled up its delivery of energy efficiency retrofit projects in City buildings. In addition, as part of its efforts to meet the 100 megawatt ("MW") of solar electricity generation capacity across municipal buildings by 2025 target, the City has pursued an alternate approach to distributed generation by installing solar photovoltaic installations.

Finally, due to the growing physical and economic threats associated with climate change, as evidenced by the consequences of Hurricane Sandy, the policy imperative for resilience has increased. Facilities that must maintain uninterrupted power for life and safety purposes even when the rest of the grid is without power are attractive candidates for Distributed Energy Resources ("DER"), a category that includes Cogen and DG, but also solar photovoltaic and battery storage. Reflecting the recognition that resilience benefits should be considered as part of feasibility assessments for on-site power generation installations, the New York State Public Service Commission now is requiring utilities conducting cost-benefit analyses to incorporate resilience considerations. While DER can serve to improve the resilience of critical facilities and enhance the reliability of the electrical grid in areas where there are distribution constraints, these benefits must be evaluated in light of potential impacts on local air quality. DERs can emit criteria pollutants like nitrogen oxide, particulate matter, formaldehyde and volatile organic compounds, which can negatively affect air quality and have consequences for public health.

⁵ Source: PlaNYC. The City of New York. 2007.

⁶ Source: Mayor's Office of Sustainability.

⁷ Source: "Power Trends, New York's Evolving Power Grid 2017." NYISO. 2017.

⁸ 80x50 is NYC's citywide climate goal to reduce citywide emissions 80 percent from Fiscal Year 2006 by 2050 with an interim goal, 40x30, of 40 percent reduction from Fiscal Year 2006 by Fiscal Year 2030.

Thus, the policy context for Cogen and DG installations, and energy supply decisions generally, is evolving beyond economic and technical drivers to incorporate socio-environmental factors. To this end, in 2017, the City Council passed Local Law 248, which requires the City to produce a Long-Term Energy Plan every four years. The plan is to include holistic consideration of DER. Moving forward, DCAS recommends that the analysis conducted for LL1 be incorporated into the Long-Term Energy Plan both to realize the greatest value from the City's energy supply-related investigations and ensure that DER are comprehensively evaluated. This recommendation is discussed more extensively in the Further Considerations section.

Figure 1: Rendering of cleaner-burning co-generation engines at West Harlem's North River Wastewater Resource Recover Facility



Five cleaner-burning co-generation steam engines will reduce greenhouse gas emissions by nearly 50 percent, comparable to taking 5,500 vehicles off the road.

Study Methodology

Overview

This section outlines the methodology that DCAS used to evaluate Cogen and DG feasibility at the 388 Covered Facilities. Covered Facilities are City-owned facilities that meet the requirements for coverage by LL1, meaning that they have exhibited a peak electrical demand of at least 500 kilowatts in the previous calendar year (Calendar Year 2017).

Before commencing the 2018 assessment, DCAS and the Mayor's Office of Sustainability ("MOS") partnered to identify opportunities to refine the methodology used in the two previous LL1 assessments. In the 2008 assessment, there were a total of 318 Covered Facilities, and in the 2013 assessment, there were a total of 341 Covered Facilities, with 23 new Facilities added. For both the 2008 and 2013 assessments, the Covered Facilities primarily were examined for their feasibility for Cogen and DG installations based on technical considerations, as compared to economic or socio-environmental benefits. In particular, the methodology used for the two previous assessments did not evaluate installations' economic viability based on their expected simple payback period. The simple payback is calculated based on the amount of time that it takes a project to recover its upfront installation costs based on its annual energy cost savings. It is equal to the number of years it takes for the projected annual energy savings to equal the upfront investment. Likewise, the methodology used for the two previous assessments did not evaluate the potential emissions reductions associated with installations. LL1 stated that Cogen and DG installations must result in fewer emissions than equivalent combined natural-gas cycle installations, but no emission savings were calculated in either the 2008 or 2013 assessments.

For the 2018 assessment, both economic and socio-environmental considerations have been added. To perform the core analysis for the 2018 assessment, DCAS evaluated the economic and technical feasibilities of the Covered Facilities to accommodate Cogen and DG installations through two rounds of screening. In the first round of screening, DCAS identified facilities where installations had a simple payback not exceeding

15 years. In the second round of screening, DCAS rank-ordered facilities based on their suitability for three different installation types, using a weighted suitability score calculated based on facilities' technical energy metrics. To supplement the core analysis of installation viability based on economic and technical feasibilities, DCAS conducted a follow-up analysis to identify facilities that might be promising candidates for Cogen and DG installations based on their potential to support specific socio-economic benefits, namely resilience and emission savings. The detailed methodology used for the core and supplemental assessments is summarized below.

Core Analysis

In the first round of screening, DCAS assessed the economic feasibility of installations by calculating the simple payback period for a theoretical Cogen installation where the investment for theoretical installation is \$4500/kW of energy used at each facility, using a tool developed by U.S. DOE and NYSEDA CHP TAP.⁹ The tool calculates the simple payback for the theoretical Cogen installation by finding the number of years that it takes for projected annual energy cost savings associated with the installation to equal the upfront capital investment cost. For this analysis, the tool compared energy cost savings projected using actual electric and thermal billing data for each Covered Facility to the capital costs of the theoretical installation. The Covered Facilities then were rank-ordered by their simple payback period, with facilities where the simple payback period of installations did not exceed 15 years. **Table 6** in Appendix displays all Covered Facilities and their corresponding simple paybacks. Given that various types of Cogen installations can have different useful lives, ranging from 10 to 30 years, the TAP elected to use a generalized installation useful life assumption of 15 years. Of course, the limitation associated with using this type of assumption is that if actual installations have shorter or longer useful lives, their simple payback periods will be understated or overstated, respectively.¹⁰

⁹ New York State's Energy Research and Development Authority's Combined Heat and Power Technical Assistance Program. The theoretical Cogen facility had a Capital Cost of \$4,593/kW of energy being offset.

¹⁰ New York State's Energy Research and Development Authority's Combined Heat and Power Technical Assistance Program. The theoretical Cogen facility had a Capital Cost of \$4,593/kW of energy being offset.

For the second round of screening, DCAS evaluated the technical feasibility of Cogen and DG installations at the facilities by calculating a weighted Suitability Score for three different types of installations. The three installation types considered were Cogen installations, DG installations focused on supporting Peak Load Shavings, and DG installations focused on supporting Continuous Operations. To determine each facility's weighted Suitability Score for the various installation types, DCAS first calculated a set of technical energy performance metrics for all facilities, including, but not limited to, annual peak demand, annual electric load factor, and the ratio of annual thermal load to electric load. DCAS then defined a set of critical energy metrics for each of the three installation types, identified target ranges for each metric, and assigned normalized scores to specific values for metrics based on where they fall within the target ranges. The process of summing the normalized scores across the critical metrics yields the Suitability Score for each installation type. **Table 1** summarizes the critical metrics, target ranges, and normalization schema for each installation type.

Based on the weighted Suitability Scores, the team generated a list of Recommended Facilities for the three installation types. Recommended Facilities had to achieve a specified minimum Suitability Score. "Recommended Facilities for Cogen," summarized in **Table 2**, are facilities that have a Cogen Suitability Score of at least 60 out of a total possible score of 85 points. "Recommended Facilities for DG-Peak Load Shaving," summarized in **Table 3**, have a DG-Peak Suitability Score of at least 55 of a total possible score of 80 points. "Recommended Facilities for DG-Continuous Operations," summarized in **Table 4**, have a DG-Continuous Operations Suitability Score of at least 75 out of a total possible score of 95 points. **Table 6** in the Appendix displays all Covered Facilities and their corresponding simple paybacks.

Supplemental Analysis

To supplement the core analysis of installation viability based on economic and technical considerations, DCAS then conducted a follow-up analysis to identify facilities that might be promising candidates for Cogen and DG installations based on their potential to support specific socio-economic benefits, even if the simple payback of such installations exceeded 15 years.

To identify facilities where installations potentially could support significant GHG emissions reductions, DCAS converted the annual energy savings projected from the theoretical Cogen installation modeled as part of the core analysis into metric tons of GHG emissions avoided annually. Cogen can produce emissions reductions because it also produces thermal energy unlike DG, which only produces electricity, and does so less efficiently than a grid-scale plant, and thus will not have any emissions reductions. The team then calculated the capital cost per metric ton of emissions avoided annually (i.e., capital investment \$ per MT emissions avoided) for Cogen facilities. This metric provides insight into the comparative effectiveness of emission reductions across potential Cogen installation and in terms of other types of GHG mitigation interventions (see **Table 6**).

Methodological Caveat

The methodology described for the core and supplemental analyses is not intended to be the sole basis for selecting City facilities for Cogen or DG installations. Instead, the methodology should be used to identify facilities that meet or exceed specified positive criteria, so that they can be targeted for additional site-specific feasibility analysis. Nevertheless, the methodology satisfies the requirements of LL1 by providing an objective basis for further evaluation of the potential for Cogen and DG installations at Recommended Facilities. In addition, there is a major caveat that should govern the use of this analysis. The simple payback calculations performed to evaluate the economic feasibility of installations are high level; they utilize generalized costs that do not take into account site-specific conditions that can significantly increase costs (e.g. changes to utility tariffs/rates, operations and maintenance, interconnection requirements, connections to gas supply, air permitting and other regulatory administrative requirements, flood protection, and after-treatment controls).

Table 1: Energy Metrics Contributing to Installation Suitability Scores

Installation Type	Energy Metric	Rationale	Requirement Range	Normalized Score
Cogen Installations	Summer Thermal Energy Consumption (steam only)	A high summer steam thermal load (i.e., >1 MMBTU) allows for continuous Cogen use throughout the year, not just in the winter, which supports efficient Cogen operation.	At least 1 MMBTU	5-30
	Annual Utility Energy Costs ¹¹	High annual utility energy costs (i.e., >\$2M) create the potential to achieve relatively greater savings through a Cogen installation.	At least \$2M	5-15
	Annual Electric Load Factor	A high electric load factor (i.e., >60 percent) indicates consistent power demand throughout the year, which supports efficient Cogen operation.	At least 60%	5-10
	Annual Thermal to Electric Load Factor	A high ratio of thermal to electric energy (i.e., >150 percent) indicates the potential to maximize Cogen efficiency, given that Cogen generates more thermal than electric energy.	At least 150%	5-10
	Average Non-Summer Electric Demand	A high average non-summer electric demand (i.e., >500 kW) indicates capacity potential during non-peak periods.	At least 500 kW	5-10
	Annual Facility Energy Consumption	High facility energy consumption (i.e., >200,000 MMBTU) creates the potential to achieve relatively greater energy savings through a Cogen installation.	At least 200,000 MMBTU	5-10
DG Installations Focused on Supporting Peak Load Shaving	Summer Electric Load Factor	A low summer electric load factor (i.e., <50 percent) indicates large variability in summer power demands, which suggests the opportunity to reduce peak demand loads during the summer, when electric costs are highest.	No more than 50%	5-30
	Difference Between Summer and Non-Summer Peak Electric Demand	A large difference between summer and non-summer peak electric demand (i.e., >100 kW)	At least 100 kW	5-20

¹¹ Annual energy costs were calculated based on utility rates and charges applied for electricity and fuel use \$/kWh .

Installation Type	Energy Metric	Rationale	Requirement Range	Normalized Score
		indicates the existence of high summer peak demand, which suggests the opportunity to maximize savings by shaving peak load.		
	Annual Electric Costs	High annual electric costs (>\$0.50M) create the potential to achieve greater savings through a DG installation.	At least \$0.50M	5-20
	Annual Electric Load Factor	A low electric load factor (<50 percent) indicates the existence of large variability in power demands throughout the year, suggesting the opportunity to reduce peak demand load during non-summer months	No more than 50%	5-10
DG Installations Focused on Supporting Continuous Operations	Summer Electric Load Factor	A high summer electric load factor (i.e., <50 percent) indicates consistent summer power demands, when electric costs are highest, thus creating the potential for relatively greater cost savings.	At least 50%	5-30
	Average Electric Demand	A high average demand (i.e., >100 Kw) allows a facility to maximize savings by installing a smaller DG system that shaves peak demand.	At least 100kW	5-20
	Annual Electric Load Factor	A high electric load factor (i.e., >50 percent) indicates consistent power demands throughout the year, which supports efficient DG operation.	At least 50 percent	5-15
	Annual Electric Costs	High annual electric costs (i.e., >\$2M) create the potential to achieve greater savings through a DG installation.	At least \$2M	5-15
	Summer Electric Costs	High summer electric costs (i.e., >\$1M) create the potential to achieve greater savings through a DG installation.	At least \$1M	5-15

Study Findings

This section summarizes the results of the core analysis and supplemental analysis examining the feasibility of the 388 Covered Facilities for Cogen and DG installations. The core analysis examines the economic and technical feasibility of installations, based on two rounds of screening: first, calculation of the simple payback period for a theoretical Cogen installation at each facility (see Appendix **Table 6**), and second, determination of a weighted Suitability Score derived from technical metrics for three different installation types at each facility (see descriptions below and **Tables 2, 3, and 4**). The supplemental analysis evaluates the GHG emissions reduction benefits and resilience benefits possible at facilities.

Recommended Facilities for Cogeneration

Based on the core analysis conducted, out of the 388 Covered Facilities, 15 facilities were identified as Recommended Facilities for Cogeneration. The 15 facilities all had a total Cogeneration Suitability

Score of at least 60 points out of a potential total score of 85 points. In the calculation of the Cogeneration Suitability Score, the energy metric that had the highest weighting, and thus the largest impact, on facilities' scores was summer thermal consumption because Cogen installations service to displace not only electric load but also thermal load.

A high summer steam thermal load (>1 MMBTU) allows for continuous Cogen operation year-round. The energy metric that had the second-highest weighting was annual energy costs since high existing utility energy costs create the potential to achieve large savings through a Cogen installation. The other four energy metrics included in score calculation were annual electric load factor, annual thermal to electric load factor, average non-summer electric demand, and annual facility energy consumption.

The 15 facilities summarized below include three water resource recovery facilities, five hospitals or healthcare-related buildings, two college campuses, two museums, the Anna M. Kross Center on Rikers Island, and the City Hall campus.

Table 2: Recommended Facilities for Cogen, Listed in Rank-Order Based on Cogen Suitability Score

DCAS Building Identification Number	Facility Name	Facility Address	Facility Type	Cogen Suitability Score
4427	Metropolitan Museum of Art	1000 5th Ave, New York, NY 10028	Museum	80
4274	Bellevue Hospital Center Campus	462 1st Ave, New York, NY 10016	Hospital or health-care facility	75
9573	Hunter College Campus	47-49 East 65th St, New York, NY 10021	College campus	75
9611	Newtown Creek WPCP Campus	329 Greenpoint Ave, Brooklyn, NY 11222	Water resource recovery facility	75
4278	Gouverneur Health Care Services	227 Madison St, New York, NY 10002	Hospital or health-care facility	70
840	North River WPCP Campus	725 West 135th St, New York, NY 10031	Water resource recovery facility	65
9582	City College of New York Campus	71 Convent Ave, New York, NY 10031	College campus	65
9607	Bowery Bay WPCP Campus	4301 Berrian Blvd, Astoria, NY 11105	Water resource recovery facility	65

DCAS Building Identification Number	Facility Name	Facility Address	Facility Type	Cogen Suitability Score
9622	City Hall Campus	City Hall, New York, NY 10007	Government office	65
10007	Rikers Island AMKC Campus	Rikers Island, Bronx, NY 11370	Correctional facility	60
3438	Public Health Laboratory	455 1st Ave, New York, NY 10016	Hospital or health-care facility	60
50	American Museum of Natural History	200 Central Park West, New York, NY 10024	Museum	60
9569	Brooklyn College Campus	2895 Bedford Ave, Brooklyn, NY 11210	College campus	60
9600	Harlem Hospital Center Campus	506 Lenox Ave, New York, NY 10037	Hospital or health-care facility	60
9601	Jacobi Medical Center Campus	1400 Pelham Pkwy South, Bronx, NY 10461	Hospital or health-care facility	60

Recommended Facilities for DG-Peak Suitability, Listed in Rank-Order Based on DG-Peak Suitability Score

Based on the core analysis conducted, out of the 388 Covered Facilities, 15 facilities were identified as high-potential for DG installations focused on supporting Peak Load Shaving. These facilities had a DG-Peak Suitability Score of at least 55 points, out of a potential total score of 80. The technical energy metric that had the largest impact on total DG-Peak Suitability Score was a low summer electric load factor (<50 percent) that indicated large variability in summer power demands, which suggests the opportunity to reduce peak demand loads during the summer, when electric costs are highest. The second highest weighted energy metric was high difference in summer and non-summer peak electric demands indicating opportunities for shaving peak season

demand. The other two energy metrics included in score calculation were annual electric cost and annual electric load factor.

The 15 facilities, summarized below, include six college campuses, six hospitals or health-care related facilities, the American Museum of Natural History, City Hall campus, and the PS 153 campus. In general, the Recommended Facilities comprise large, campus-style buildings that have central electric service and low summer electric load factors. These energy characteristics create the opportunity for a DG installation to reduce utility energy demand during peak load season. A more detailed study of historic and projected electricity demand would be needed to better estimate the actual size of Distributed Generation that will shave peak electric demand during the peak demand periods.

Table 3: Recommended Facilities for DG-Peak, Listed in Rank-Order Based on DG-Peak Suitability Score

DCAS Building Identification Number	Facility Name	Facility Address	Facility Type	DG-Peak Suitability Score
9570	College of Staten Island Campus	2800 Victory Blvd, Staten Island, NY 10314	College campus	60
9573	Hunter College Campus	47-49 East 65th St, New York, NY 10021	College campus	60
9575	Kingsborough Community College Campus	2055 Oriental Blvd, Brooklyn, NY 11235	College campus	60

DCAS Building Identification Number	Facility Name	Facility Address	Facility Type	DG-Peak Suitability Score
9580	Queens College Campus	65-90 Kissena Blvd, Flushing, NY 11367	College campus	60
9622	City Hall Campus	City Hall, New York, NY 10007	Government office	60
4274	Bellevue Hospital Center Campus	462 1st Ave, New York, NY 10016	Hospital or health-care facility	55
4327	Woodhull Medical and Mental Health Center	760 Broadway, Brooklyn, NY 11206	Hospital or health-care facility	55
50	American Museum of Natural History	200 Central Park West, New York, NY 10024	Museum	55
9569	Brooklyn College Campus	2895 Bedford Ave, Brooklyn, NY 11210	College campus	55
9582	City College of New York Campus	71 Convent Ave, New York, NY 10031	College campus	55
9600	Harlem Hospital Center Campus	506 Lenox Ave, New York, NY 10037	Hospital or health-care facility	55
9601	Jacobi Medical Center Campus	1400 Pelham Pkwy South, Bronx, NY 10461	Hospital or health-care facility	55
9602	Kings County Hospital Campus	547 Winthrop Ave, Brooklyn, NY 11203	Hospital or health-care facility	55
9604	Elmhurst Hospital Center Campus	79-01 Broadway, Flushing, NY 11373	Hospital or health-care facility	55
9918	PS 153 Hellen Keller Campus	650 Baychester Ave, Bronx, NY 10475	K-12 School	55

Recommended Facilities for DG-Continuous Operations

Based on the core analysis conducted, out of the 388 Covered Facilities, 11 facilities were identified as high-potential for DG installations focused on supporting Continuous Operations. These facilities had a DG-Continuous Operations Score of at least 75 points, out of a potential total score of 95. The technical energy metric that had the largest impact on total DG-Peak Suitability Score was a high summer electric load factor (>50 percent) that indicates consistent summer power demands, when electric costs are highest, thus creating the potential for relatively greater cost savings. The second highest weighted energy metrics was high average electric demand indicating consistent electricity consumption. The other three energy metrics included in score

calculation were annual electric cost, annual electric load factor, and summer electric costs.

The 11 facilities, summarized below, include seven water resource recovery facilities, two hospitals or healthcare-related facilities, the City College of New York Campus, and the Metropolitan Museum of Art. In general, the Recommended Facilities primarily comprise water resource recovery facilities that have central electric services and high annual electric load factors. These energy characteristics allow for continuous operation of a central electric plant at or close to full capacity. A detailed site-specific analysis would need to be conducted in order to determine if there is a cost-benefit case to be made.

In comparing the facilities identified as high-potential for DG-Continuous Operations and those for DG-Peak Suitability, it is important to note that these two types of DG installations have different intended core functions. DG-Continuous Operations installations are primarily focused on meeting the need for plants that operate nearly continuously to meet consistently high electricity demand year-round. In contrast,

DG-Peak Suitability systems, while able to provide service on an ongoing basis, are primarily focused on providing service during peak demand periods. Since both installation types have opposing energy metric requirements, facilities that are suitable for both installation types generally meet the common requirement of high annual electric costs.

Table 4: Recommended Facilities for DG-Continuous Operations, Listed in Rank-Order Based on DG-Continuous Operations Suitability Score

DCAS Building Identification Number	Facility Name	Facility Address	Facility Type	DG-CO Suitability Score
9611	Newtown Creek WPCP Campus	329 Greenpoint Ave, Brooklyn, NY 11222	Water resource recovery facility	95
9582	City College of New York Campus	71 Convent Ave, New York, NY 10031	College campus	90
4427	Metropolitan Museum of Art	1000 5th Ave, New York, NY 10028	Museum	85
859	Wards Island WPCP Campus	Wards Island, New York, NY 10035	Water resource recovery facility	80
9601	Jacobi Medical Center Campus	1400 Pelham Pkwy South, Bronx, NY 10461	Hospital or health-care facility	80
9607	Bowery Bay WPCP Campus	4301 Berrian Blvd, Astoria, NY 11105	Water resource recovery facility	80
9609	Hunts Point WPCP Campus	1270 Ryawa Ave, Bronx, NY 10474	Water resource recovery facility	80
840	North River WPCP Campus	725 West 135th St, New York, NY 10031	Water resource recovery facility	75
9602	Kings County Hospital Campus	547 Winthrop Ave, Brooklyn, NY 11203	Hospital or health-care facility	75
9610	Jamaica WPCP Campus	150-20 134th St, South Ozone Park, NY 11430	Water resource recovery facility	75
9613	Owl's Head WPCP Campus	6700 Shore Rd, Brooklyn, NY 11220	Water resource recovery facility	75

Recommended Facilities for All Three Installation Types

Out of the 388 Covered Facilities, seven facilities were identified as high-potential facilities for Cogen, DG focused on supporting Peak Load Shaving, and DG focused on supporting Continuous Operations, based on the Suitability Scores received across all three installation types. The seven facilities included the center campuses for Bellevue Hospital, Brooklyn College, Harlem Hospital, Kings County Hospital, Gouverneur Health Care Services, City College of New York, and Jacobi Medical Center.

Out of the seven facilities, three facilities, Bellevue Hospital, Jacobi Medical Center, and Brooklyn College, were recommended under the previous LL1 assessment as high-potential locations for Cogen or DG implementation. Currently, the City is progressing installation efforts at two of these facilities.

- At Bellevue Hospital, plans are being advanced to install a 4.2 MW Cogeneration plant to maintain critical operations during utility service disruptions. Bellevue Hospital staff have completed the necessary economic and technical analyses for the project and are evaluating regulatory requirements that must be met before installation can be started.
- At Jacobi Medical Center, plans are being advanced to participate in the proposed East Bronx Healthcare Microgrid. The East Bronx Healthcare Microgrid is intended to mitigate the risk of single generators failing during prolonged outages. Gotham 360, Enwave, Burns & McDonnell, Van Zelm Engineers, CW, Utilivisor, and Consolidated Edison will design a district energy system microgrid in the East Bronx that will provide heat and power to four hospitals (Weiler Hospital, Jacobi Medical Center, Albert Einstein College of Medicine, and Calvary Hospital). The East Bronx Microgrid Project recently won a \$1,000,000 grant from NYSERDA's NY Prize, a statewide initiative focused on modernizing New York City's electricity grid.

- At Brooklyn College, following the completion of the 2013 LL1 assessment, the City conducted a follow-up site-specific evaluation and determined the campus to be a poor candidate for Cogeneration, as the facility has multiple secondary services, and previously there needed to be one central electric service point of interconnection. However, the facility may merit further assessment regarding for its suitability for DG-Peak Load Shaving and DG Continuous Operation installations.

Greenhouse Gas Emissions Reduction Potential of Cogen Installations

To evaluate the cost-effectiveness of emissions reductions that could be achieved through Cogen installations, for all Covered Facilities, DCAS determined the investment cost per metric ton of emissions avoided annually if a Cogen installation were implemented, found by dividing the capital cost of the project by the annual emissions reduction (expressed in terms of metric tons) that it is expected to create. Across all Covered Facilities, the average investment cost for a potential Cogen installation per metric ton of emissions avoided annually was found to be \$6,900, with the range extending from \$3,190 to \$10,020 per metric ton of emissions avoided annually for individual facilities. This cost-effectiveness metric was calculated only for a potential Cogen installation, not for a DG installation, because, while Cogen installations create emissions reductions by recycling thermal energy to produce electric energy, DG installations only produce electric energy, and do so less efficiently than grid-scale plants, which means that they do not result in emissions reductions.

To evaluate the cost-effectiveness of emissions reductions achieved through Cogen installations relative to those realized through other types of interventions, DCAS then compared the investment cost per metric ton of emissions avoided annually for Cogen installations to that for energy efficiency retrofit projects. For energy efficiency retrofit projects completed from Fiscal Year 2014 to Fiscal Year 2018 through DEM's ACE and ExCEL Programs,

the average cost per metric ton of emissions avoided annually ranged from \$970 to \$1,160 for expense-funded projects (i.e., ExCEL projects) and \$3,360 to \$4,140 for capital-funded projects (i.e., ACE projects).¹² Based on these figures, Cogen installations represent a relatively more expensive way for the City to achieve emissions reductions in its buildings relative to energy efficiency projects.

Recommended Facilities for Resilience -Focused Installations

In addition to the core analysis, which focused on evaluating potential Cogen and DG installations based on their technical and economic feasibilities, DCAS conducted a supplemental analysis that took into account installations' capability to provide resiliency benefits. DCAS identified Covered Facilities which constitute high-priority sites for resiliency using New York State's definition for "critical infrastructure." The state's definition covers sites like police stations, fire stations, hospitals, nursing homes, emergency shelters, and water resource recovery facilities. For the high-priority resiliency sites, DCAS extended the simple payback period that was considered economically viable for installations from 15 years to 25 years.

Out of the 388 Covered Facilities, 40 facilities meet the criteria for "critical infrastructure" and have a simple payback that does not exceed 25 years. These facilities should be further prioritized for evaluation of their capacity to accommodate Cogen and DG installations based on resiliency benefits. It must be noted that of the 40, nine recommended facilities are schools. For more information on whether these schools have been designated as emergency/disaster shelters, please refer to New York City's Emergency Management website.¹³

¹² Through the ExCEL and ACE Programs, DEM provides competitive expense and capital funding to agencies to implement expense- and capital-funded energy efficiency retrofit projects, respectively, in City buildings. The low-high cost ranges provided for each program represent the aggregate average (i.e., aggregate investments divided by aggregate emissions reductions for all projects) cost per metric ton of emissions avoided annually and the median cost per metric ton of emissions avoided annually for all projects completed FY14-FY18. Values were rounded to the nearest tenth.

¹³ <https://www1.nyc.gov/site/em/about/overview.page>

Table 5: Recommended Facilities for Resilience-Focused Installations

DCAS Building Identification Number	Facility Name	Facility Address	Simple Payback Period (years)	Cogen Suitability Score	DG-Peak Suitability Score	DG-CO Suitability Score
7073	M485	100 Amsterdam Ave, New York, NY 10023	3.1	20	20	15
7066	M460	40 Irving Pl, New York, NY 10003	3.2	20	15	5
5419	Bellevue Hospital Center (Space) (Leased In)	492 1st Ave, New York, NY 10016	3.6	5	5	40
3987	Brooklyn Cruise Terminal Pier 11	Clinton Wharf, Brooklyn, NY 11231	3.6	25	40	15
295	OCME Center for Forensic Sciences	421 East 26th St, New York, NY 10016	3.6	45	50	45
294	Manhattan Chief Medical Examiner	520 1st Ave, New York, NY 10016	3.6	10	15	30
4274	Bellevue Hospital Center Campus	462 1st Ave, New York, NY 10016	4.3	75	55	70
7085	M620	111 East 33rd St, New York, NY 10016	4.6	35	10	20
7080	M520	411 Pearl St, New York, NY 10038	4.9	45	5	60
9892	(X405, X406) Campus	3000 East Tremont Ave, Bronx, NY 10461	6.3	25	20	15
3438	Public Health Laboratory	455 1st Ave, New York, NY 10016	6.7	60	25	55
4287	Metropolitan Hospital Center Campus	1901 1st Ave, New York, NY 10029	7.1	45	45	60
9600	Harlem Hospital Center Campus	506 Lenox Ave, New York, NY 10037	7.1	60	55	65
4337	Queens Hospital Center Campus	82-70 164th St, Jamaica, NY 11432	7.5	50	45	60
4308	Coney Island Hospital	2601 Ocean Pkwy, Brooklyn, NY 11235	7.7	45	30	55
4278	Gouverneur Health Care Services	227 Madison St, New York, NY 10002	7.8	70	15	65
4298	Lincoln Medical and Mental Health Center	234 East 149th St, Bronx, NY 10451	7.8	55	50	70
9602	Kings County Hospital Campus	547 Winthrop Ave, Brooklyn, NY 11203	8.1	60	55	75
7790	X435	500 Fordham Rd, Bronx, NY 10458	8.3	15	15	5
9746	(K455, K456) Campus	1700 Fulton St, Brooklyn, NY 11213	8.5	20	10	20
10559	M912	521 West 43rd St, New York, NY 10036	9.0	5	15	15
5620	Hunts Point Market	Bay Ave at Halleck St, Bronx, NY 10474	9.3	10	15	30
4305	North Central Bronx Hospital	3424 Kossuth Ave, Bronx, NY 10467	9.4	50	45	60
9616	Rockaway WPCP Campus	106-21 Beach Channel Dr, Rockaway Park, NY 11694	9.4	50	10	65
9919	Petrides Complex Campus	715 Ocean Ter, Staten Island, NY 10301	9.6	15	20	15

DCAS Building Identification Number	Facility Name	Facility Address	Simple Payback Period (years)	Cogen Suitability Score	DG-Peak Suitability Score	DG-CO Suitability Score
9601	Jacobi Medical Center Campus	1400 Pelham Pkwy South, Bronx, NY 10461	9.9	60	55	80
9084	Henry J. Carter Hospital	1879 Madison Ave, New York, NY 10035	10.1	35	15	55
9632	Police Academy	130-30 28th Ave, College Point, NY 11354	10.3	45	20	60
4327	Woodhull Medical and Mental Health Center	760 Broadway, Brooklyn, NY 11206	10.4	50	55	65
6790	K465	911 Flatbush Ave, Brooklyn, NY 11226	11.3	20	15	5
4575	NYPD Police Laboratory	150-14 Jamaica Ave, Jamaica, NY 11432	11.4	15	20	35
9921	Croton Water Treatment Plant	3701 Jerome Ave, Bronx, NY 10467	12.3	55	30	55
9604	Elmhurst Hospital Center Campus	79-01 Broadway, Flushing, NY 11373	13.5	55	55	65
9631	Henry J. Carter Hospital - Skilled Nursing Facility	1752 Park Ave, New York, NY 10035	13.6	5	10	35
3478	Staten Island Ferry Terminal (Whitehall)	4 South St, New York, NY 10004	15.1	25	10	45
9611	Newtown Creek WPCP Campus	329 Greenpoint Ave, Brooklyn, NY 11222	15.2	75	25	95
9617	Tallman Island WPCP Campus	127-01 Powells Cove Blvd, College Point, NY 11356	15.6	50	10	70
9607	Bowery Bay WPCP Campus	4301 Berrian Blvd, Astoria, NY 11105	20.6	65	25	80
9606	26th Ward WPCP Campus	122-66 Flatlands Ave, Brooklyn, NY 11207	22.1	40	25	65
9610	Jamaica WPCP Campus	150-20 134th St, South Ozone Park, NY 11430	23.6	35	20	75

Considerations for Future Assessments

As discussed in the Study Background, since LL1 was passed in 2007, the energy landscape within New York State has evolved. The original intent of LL1 was to identify City-owned facilities that could be suitable for Cogen and DG installations to support clean power generation and achieve significant emissions reductions. However, since 2007, there have been several changes that have altered the relative value of Cogen and DG installations, as conceived in LL1, for providing emissions reductions, as well as offering other benefits. First, the carbon intensity of the electric grid has decreased, reducing the emissions reductions benefits associated with avoiding grid power usage. Further, the low price of natural gas has decreased potential energy cost savings associated with Cogen and DG installations. In addition, DCAS has significantly expanded its strategies for achieving emissions reductions, including by launching Load Management and Demand Response efforts and scaling up its delivery of energy efficiency retrofit projects. Third, the City has commenced pursuit of an alternate approach to DG, implementing solar photovoltaic installations across the City's portfolio to comply with the City's 100MW by 2025 target. Finally, with the growing physical and economic threats associated with climate change, the policy imperative for resiliency has grown. This change has reinforced the importance of maintaining uninterrupted power flow at specific "critical infrastructure" facilities that provide essential life and safety functions. In addition, resiliency considerations now are being coupled with equity considerations.

Given these important changes in the energy landscape, as well as the insight gained from the analysis conducted for this 2018 assessment, three changes are recommended as the City undertakes future assessments of Cogen and DG viability across its portfolio.

First, it is recommended that a sunset provision be added to LL1, and that the LL1-associated requirement to evaluate City facilities for their potential to accommodate DG and Cogen be fully incorporated into Local Law 248 of 2017 ("LL248"). Implementation of this recommendation would eliminate content overlap that currently exists between the two bills, and enable the City to consolidate the findings from its energy supply-related investigations. LL248 requires that the City develop a Long-Term Energy Plan every four years, starting in Calendar Year 2019. Per the bill's mandate, the City must evaluate the City's current and future energy supply, with the latter term defined to

include not only "power plants and any other facilities that generate energy... used in the city; infrastructure that transmits or distributes energy...; [and] any fuels that are used in buildings or facilities," but also "distributed generation sources of electricity, including Cogeneration and energy storage." Thus, the Long-Term Energy Plan already explicitly requires consideration of DG and Cogen applicability within the City.

Second, it is recommended that, as LL248 supersedes LL1, the requirement to periodically evaluate City facilities for DG and Cogen viability become part of every other publication cycle for LL248. This change would revise the timeframe for periodic evaluations from every five years (under LL1) to every eight years. This update frequency better aligns with the timeframe over which substantive structural changes in energy supply are likely to occur. The change also will enable the City to concentrate its personnel and financial resources on completing less frequent, but potentially more intensive, feasibility investigations. This is important given the size of the City's portfolio, as well as the complexity of these assessments, given all of the factors involved.

Finally, it is recommended that, as LL248 supersedes LL1, the required assessments of City facilities for Cogen and DG viability be expanded beyond "technical, physical, and/or economic feasibility" considerations, as specified by the original LL1 language, to include other benefits. These should include socio-environmental benefits, such as resiliency and equity. For example, policymakers should evaluate Cogen and DG installations in light of related policy objectives such as ensuring that vulnerable populations are not disproportionately impacted by power outages, reducing exposure to airborne pollutants associated with certain types of DER, and alleviating undue high energy costs.¹⁴ The inherently broader purview of the Long-Term Energy Plan, as compared to that of the current LL1 assessment, fundamentally sets the stage for potential installations to be examined more holistically.

¹⁴ "Energy burden means the percentage of household income that goes toward energy costs." American Council for an Energy-Efficient Economy. 2016.

Appendix

Table 6: All Facilities, Listed in Rank-Order on Simple Payback with associated Suitability

DCAS Building Identification Number	Facility Name	Facility Address	Simple Payback (years) ¹⁵	Cogen Suitability Score	DG-Peak Suitability Score	DG-Continuous Operations (CO) Suitability Score	Capital Cost Per Avoided Emissions (\$ Per Metric Tons of Emissions Avoided Annually)
10010	Rikers Island EMTC Campus	Rikers Island, Bronx, NY 11370	-611.9	45	20	30	\$6,112
10007	Rikers Island AMKC Campus	Rikers Island, Bronx, NY 11370	-44.7	60	15	50	\$7,735
10015	Rikers Island West Facility Campus	Rikers Island, Bronx, NY 11370	-41.9	35	25	35	\$9,155
840	North River WPCP Campus	725 West 135th St, New York, NY 10031	-35.4	65	20	75	\$3,194
10006	Rikers Island RMSC Campus	Rikers Island, Bronx, NY 11370	-32.5	45	10	55	\$6,116
10011	Rikers Island GMDC Campus	Rikers Island, Bronx, NY 11370	-32.0	50	15	35	\$6,115
10014	Rikers Island RNDC Campus	Rikers Island, Bronx, NY 11370	-31.6	50	15	35	\$6,114
10016	Rikers Island OBCC Campus	Rikers Island, Bronx, NY 11370	-30.6	50	10	50	\$6,115
10009	Rikers Island JATC Campus	Rikers Island, Bronx, NY 11370	-30.6	50	10	50	\$6,115
1205	Rikers Island GRVC Detention Facility	Rikers Island, Bronx, NY 11370	-28.0	40	15	50	\$7,487
9588	Bronx Zoo Campus	2300 Southern Blvd, Bronx, NY 10460	-25.9	50	30	0	\$9,930
9613	Owl's Head WPCP Campus	6700 Shore Rd, Brooklyn, NY 11220	-17.7	30	20	75	\$2,927
1027	Manhattan Supreme Court	60 Centre St, New York, NY 10007	2.6	5	25	15	\$13,122
1024	Manhattan Civil Court	111 Centre St, New York, NY 10013	2.6	5	25	15	\$13,118
9622	City Hall Campus	City Hall, New York, NY 10007	2.9	65	60	55	\$7,946
323	Graduate Center	365 Fifth Ave, New York, NY 10016	3.0	25	20	35	\$12,923
9574	John Jay College Campus	899 Tenth Ave, New York, NY 10019	3.0	55	35	45	\$8,032
7073	M485	100 Amsterdam Ave, New York, NY 10023	3.1	20	20	15	\$13,115

¹⁵ Negative Simple Payback indicates that the installed cost of installing the Cogen is higher than the projected savings

DCAS Building Identification Number	Facility Name	Facility Address	Simple Payback (years) ¹⁵	Cogen Suitability Score	DG-Peak Suitability Score	DG-Continuous Operations (CO) Suitability Score	Capital Cost Per Avoided Emissions (\$ Per Metric Tons of Emissions Avoided Annually)
7066	M460	40 Irving Pl, New York, NY 10003	3.2	20	15	5	\$13,111
1026	Manhattan Family Court	60 Lafayette St, New York, NY 10013	3.3	15	35	45	\$13,116
9567	BMCC Campus	163 West 125th St, New York, NY 10027	3.3	40	40	60	\$8,027
5419	Bellevue Hospital Center (Space) (Leased In)	492 1st Ave, New York, NY 10016	3.6	5	5	40	\$13,124
3987	Brooklyn Cruise Terminal Pier 11	Clinton Wharf, Brooklyn, NY 11231	3.6	25	40	15	\$10,129
295	OCME Center for Forensic Sciences	421 East 26th St, New York, NY 10016	3.6	45	50	45	\$8,050
294	Manhattan Chief Medical Examiner	520 1st Ave, New York, NY 10016	3.6	10	15	30	\$13,124
6455	FIT Campus: Building E	200 West 27th St, New York, NY 10001	3.7	10	5	35	\$13,116
4467	NYPD Police Headquarters	1 Police Plz, New York, NY 10038	4.2	55	30	70	\$8,024
4274	Bellevue Hospital Center Campus	462 1st Ave, New York, NY 10016	4.3	75	55	70	\$6,269
4598	Central Library - Stephen A. Schwartzman Building	476 5th Ave, New York, NY 10018	4.4	45	20	55	\$8,048
50	American Museum of Natural History	200 Central Park West, New York, NY 10024	4.4	60	55	60	\$7,062
7085	M620	111 East 33rd St, New York, NY 10016	4.6	35	10	20	\$13,136
293	Carnegie Hall	881 7th Ave, New York, NY 10019	4.8	25	15	45	\$8,053
7080	M520	411 Pearl St, New York, NY 10038	4.9	45	5	60	\$8,046
4427	Metropolitan Museum of Art	1000 5th Ave, New York, NY 10028	5.0	80	50	85	\$6,260
6453	FIT Campus: Building C	207 West 27th St, New York, NY 10001	5.2	40	10	50	\$8,048
6458	FIT Campus: Building B	227 West 27th St, New York, NY 10001	5.2	35	5	35	\$8,051
6454	FIT Campus: Building D	300 7th Ave, New York, NY 10001	5.2	35	10	35	\$8,050
1291	FIT Campus: Building A	340 8th Ave, New York, NY 10001	5.2	40	10	35	\$7,993
9573	Hunter College Campus	47-49 East 65th St, New York, NY 10021	5.3	75	60	60	\$6,340

DCAS Building Identification Number	Facility Name	Facility Address	Simple Payback (years) ¹⁵	Cogen Suitability Score	DG-Peak Suitability Score	DG-Continuous Operations (CO) Suitability Score	Capital Cost Per Avoided Emissions (\$ Per Metric Tons of Emissions Avoided Annually)
1049	Queens Supreme Court	88-11 Sutphin Blvd, Jamaica, NY 11435	5.4	5	30	15	\$7,692
9566	Baruch College Campus	17 Lexington Ave, New York, NY 10010	5.4	25	45	45	\$11,241
9892	(X405, X406) Campus	3000 East Tremont Ave, Bronx, NY 10461	6.3	25	20	15	\$10,126
9577	Lehman College Campus	2920 Goulden Ave, Bronx, NY 10468	6.4	55	30	60	\$6,142
3438	Public Health Laboratory	455 1st Ave, New York, NY 10016	6.7	60	25	55	\$10,018
9569	Brooklyn College Campus	2895 Bedford Ave, Brooklyn, NY 11210	7.0	60	55	70	\$5,444
4287	Metropolitan Hospital Center Campus	1901 1st Ave, New York, NY 10029	7.1	45	45	60	\$5,965
9600	Harlem Hospital Center Campus	506 Lenox Ave, New York, NY 10037	7.1	60	55	65	\$6,037
4337	Queens Hospital Center Campus	82-70 164th St, Jamaica, NY 11432	7.5	50	45	60	\$6,145
4308	Coney Island Hospital	2601 Ocean Pkwy, Brooklyn, NY 11235	7.7	45	30	55	\$6,143
4278	Gouverneur Health Care Services	227 Madison St, New York, NY 10002	7.8	70	15	65	\$10,012
4298	Lincoln Medical and Mental Health Center	234 East 149th St, Bronx, NY 10451	7.8	55	50	70	\$6,144
9602	Kings County Hospital Campus	547 Winthrop Ave, Brooklyn, NY 11203	8.1	60	55	75	\$5,445
9572	Hostos Community College Campus	135 East 146th St, Bronx, NY 10451	8.1	25	30	30	\$10,128
52	BAM Peter Jay Sharp Theater (Opera House)	30 Lafayette Ave, Brooklyn, NY 11217	8.2	10	15	5	\$10,131
7790	X435	500 Fordham Rd, Bronx, NY 10458	8.3	15	15	5	\$10,130
9576	LaGuardia Community College Campus	30-20 Thomson Ave, Long Island City, NY 11101	8.3	20	35	45	\$8,268
9579	College of Technology Campus	259 Adams St, Brooklyn, NY 11201	8.5	25	50	45	\$9,591
4698	The Public Theater	425 Lafayette St, New York, NY 10003	8.5	5	10	20	\$10,127
9746	(K455, K456) Campus	1700 Fulton St, Brooklyn, NY 11213	8.5	20	10	20	\$6,618
9582	City College of New York Campus	71 Convent Ave, New York, NY 10031	8.6	65	55	90	\$6,145

DCAS Building Identification Number	Facility Name	Facility Address	Simple Payback (years) ¹⁵	Cogen Suitability Score	DG-Peak Suitability Score	DG-Continuous Operations (CO) Suitability Score	Capital Cost Per Avoided Emissions (\$ Per Metric Tons of Emissions Avoided Annually)
9578	Medgar Evers College Campus	1150 Carroll St, Brooklyn, NY 11225	8.7	40	25	35	\$6,619
10559	M912	521 West 43rd St, New York, NY 10036	9.0	5	15	15	\$10,130
1113	Fort Washington Armory-Shelter (Project Renewal)	216 Ft Washington Ave, New York, NY 10032	9.1	10	15	20	\$10,124
9575	Kingsborough Community College Campus	2055 Oriental Blvd, Brooklyn, NY 11235	9.3	45	60	45	\$6,622
5620	Hunts Point Market	Bay Ave at Halleck St, Bronx, NY 10474	9.3	10	15	30	\$10,128
4305	North Central Bronx Hospital	3424 Kossuth Ave, Bronx, NY 10467	9.4	50	45	60	\$5,792
9616	Rockaway WPCP Campus	106-21 Beach Channel Dr, Rockaway Park, NY 11694	9.4	50	10	65	\$6,619
9590	Brooklyn Botanical Garden Campus	1000 Washington Ave, Brooklyn, NY 11225	9.5	10	10	20	\$10,128
9919	Petrides Complex Campus	715 Ocean Ter, Staten Island, NY 10301	9.6	15	20	15	\$9,584
9580	Queens College Campus	65-90 Kissena Blvd, Flushing, NY 11367	9.7	55	60	65	\$5,916
9601	Jacobi Medical Center Campus	1400 Pelham Pkwy South, Bronx, NY 10461	9.9	60	55	80	\$5,851
9621	Flushing Meadows Corona Park Campus	131-00 Avery Ave, Flushing, NY 11355	9.9	10	10	20	\$10,126
9084	Henry J. Carter Hospital	1879 Madison Ave, New York, NY 10035	10.1	35	15	55	\$6,618
9591	New York Botanical Garden Campus	2900 Southern Blvd, Bronx, NY 10458	10.1	35	20	35	\$6,619
9632	Police Academy	130-30 28th Ave, College Point, NY 11354	10.3	45	20	60	\$6,620
4327	Woodhull Medical and Mental Health Center	760 Broadway, Brooklyn, NY 11206	10.4	50	55	65	\$7,947
1009	100 Gold Street Office Building	100 Gold St, New York, NY 10038	10.6	15	35	35	\$8,490
206	Brooklyn Museum	200 Eastern Pkwy, Brooklyn, NY 11238	10.7	40	25	45	\$6,616
9564	Queens Borough Hall Campus	25-01 Queens Blvd, Forest Hills, NY 11415	10.8	35	35	45	\$5,887

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9563	Manhattan Criminal Court Campus	138-40 Centre St, New York, NY 10013	11.3	45	50	55	\$5,216
6790	K465	911 Flatbush Ave, Brooklyn, NY 11226	11.3	20	15	5	\$8,063
4575	NYPD Police Laboratory	150-14 Jamaica Ave, Jamaica, NY 11432	11.4	15	20	35	\$9,526
9581	Queensborough Community College Campus	220-09 56th Ave, Bayside, NY 11364	11.6	50	20	45	\$8,341
3823	Queens Museum of Art	52-01 Grand Central Parkway, Corona, NY 11368	12.1	10	10	35	\$10,130
3950	Queens West 2,3,4 District Garages; Central Repair Shop	52-35 58th St, Flushing, NY 11377	12.2	55	15	40	\$10,124
9921	Croton Water Treatment Plant	3701 Jerome Ave, Bronx, NY 10467	12.3	55	30	55	\$8,336
3531	Asphalt Green Recreation Facility	1750 York Ave, New York, NY 10128	12.5	20	5	35	\$14,136
9625	Brooklyn Criminal Court Campus	120 Schermerhorn St, Brooklyn, NY 11201	12.6	45	20	45	\$6,620
10224	Public Safety Answering Center II	350 Marconi St, Bronx, NY 10461	13.2	35	25	50	\$8,693
1033	Bronx County Courthouse	851 Grand Concourse, Bronx, NY 10451	13.5	5	25	15	\$2,927
9604	Elmhurst Hospital Center Campus	79-01 Broadway, Flushing, NY 11373	13.5	55	55	65	\$5,679
9631	Henry J. Carter Hospital - Skilled Nursing Facility	1752 Park Ave, New York, NY 10035	13.6	5	10	35	\$10,121
9570	College of Staten Island Campus	2800 Victory Blvd, Staten Island, NY 10314	14.6	25	60	55	\$10,123
4756	Queens Central Library	89-11 Merrick Blvd, Jamaica, NY 11432	15.0	15	5	60	\$10,128
3478	Staten Island Ferry Terminal (Whitehall)	4 South St, New York, NY 10004	15.1	25	10	45	\$10,131
9611	Newtown Creek WPCP Campus	329 Greenpoint Ave, Brooklyn, NY 11222	15.2	75	25	95	\$5,857
9617	Tallman Island WPCP Campus	127-01 Powells Cove Blvd, College Point, NY 11356	15.6	50	10	70	\$6,473
49	Museum of the Moving Image	36-01 35th Ave, Astoria, NY 11106	15.7	10	5	35	\$10,121

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3922	Brooklyn North 1 District & 4 District Garage	157-175 Varick Ave, Brooklyn, NY 11237	17.2	35	0	45	\$6,620
4425	Museum of the City of New York	1220 5th Ave, New York, NY 10029	19.7	10	0	40	\$10,125
1048	Queens Family Court	151-02 Jamaica Ave, Jamaica, NY 11432	20.4	40	5	60	\$9,173
9607	Bowery Bay WPCP Campus	4301 Berrian Blvd, Astoria, NY 11105	20.6	65	25	80	\$8,268
9606	26th Ward WPCP Campus	122-66 Flatlands Ave, Brooklyn, NY 11207	22.1	40	25	65	\$6,442
9610	Jamaica WPCP Campus	150-20 134th St, South Ozone Park, NY 11430	23.6	35	20	75	\$9,966
10906	Valhalla UV Facility Campus	10 Walker Rd, Mount Pleasant, NY 10595	28.6	40	20	50	\$6,620
3522	St. George Ferry Terminal	1 Richmond Terrace, Staten Island, NY 10301	31.8	35	5	65	\$9,382
9609	Hunts Point WPCP Campus	1270 Ryawa Ave, Bronx, NY 10474	35.7	35	20	80	\$9,580
9608	Coney Island WPCP Campus	2591 Knapp St, Brooklyn, NY 11235	46.8	55	25	70	\$5,497
986	Kingston Office	71 Smith Ave, Kingston, NY 12401	80.7	10	10	20	\$10,122
4339	Sea View Robitzek Building	460 Brielle Ave, Staten Island, NY 10314	N/A	40	15	35	N/A
9603	Coler-Goldwater Hospital Campus	900 Main St, New York, NY 10044	N/A	10	40	35	N/A
4460	13th Precinct	230 East 21st St, New York, NY 10010	N/A	10	20	20	N/A
4304	Morrisania DTC Center	1225 Gerard Ave, Bronx, NY 10452	N/A	5	15	5	N/A
4311	Dr. Susan Smity McKinney Nursing Center	594 Albany Ave, Brooklyn, NY 11203	N/A	0	20	30	N/A
1034	Bronx Family and Criminal Court	215 East 161st St, Bronx, NY 10451	N/A	10	20	45	N/A
1036	Brooklyn Family Court: Condo Unit (Space)	330 Jay St, Brooklyn, NY 11201	N/A	10	25	30	N/A
903	Bronx Housing Court	1118 Grand Concourse, Bronx, NY 10456	N/A	5	15	5	N/A
1047	Queens Civil Court	89-17 Sutphin Blvd, Jamaica, NY 11435	N/A	5	20	15	N/A

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859	Wards Island WPCP Campus	Wards Island, New York, NY 10035	N/A	50	20	80	N/A
9614	Port Richmond WPCP Campus	1801 Richmond Ter, Staten Island, NY 10310	N/A	30	10	70	N/A
9615	Red Hook WPCP Campus	63 Flushing Ave, Brooklyn, NY 11205	N/A	25	15	55	N/A
9612	Oakwood Beach WPCP Campus	74 Tarlton St, Staten Island, NY 10306	N/A	25	10	60	N/A
989	Margaretville WWTP	41158 State Hwy 28, Margaretville, NY 12455	N/A	20	10	20	N/A
5241	Paerdegat Sewage Pumping Station	6016 Flatlands Ave, Brooklyn, NY 11236	N/A	5	15	5	N/A
5383	Spring Creek Auxiliary WPCP	12820 Flatlands Ave, Brooklyn, NY 11208	N/A	5	20	5	N/A
8492	Gowanus Pumping Station (Non-building)	209 Douglass St, Brooklyn, NY 11217	N/A	5	10	50	N/A
5000	179th Street Pumping Station (Non-building)	2405 Amsterdam Ave, New York, NY 10033	N/A	5	10	10	N/A
5566	Hannah Street Pumping Station (Non-building)	1 Hannah St, Staten Island, NY 10301	N/A	5	30	5	N/A
8554	Paerdegat Collection Facility South	1076 Bergen Ave, Brooklyn, NY 11234	N/A	5	5	25	N/A
5255	Conner Street Pumping Station (Non-building)	3200 Conner St, Bronx, NY 10475	N/A	0	30	5	N/A
5522	Eltingville Pumping Station (Non-building)	102 Glencoe St, Staten Island, NY 10304	N/A	0	30	5	N/A
5532	Ave V Sewage Pumping Station (Non-building)	7696 Ave V, Brooklyn, NY 11223	N/A	0	35	5	N/A
5979	Throgs Neck Sewage Pumping Station (Non-building)	Zerga at Lafayette Ave, Bronx, NY 10462	N/A	0	30	0	N/A
6121	Croton Falls Maintenance House (Non-building)	790 Croton Falls Road, Carmel, NY 10512	N/A	0	30	0	N/A
947	Victory Boulevard Campus/New Clove Pumping Station (Non-building)	10 Logan Ave, Staten Island, NY 10301	N/A	0	10	20	N/A

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6069	Roosevelt Island Pumping Station (Non-building)	728 Main St N, New York, NY 10044	N/A	0	35	5	N/A
6014	Howard Beach Pumping Station (Non-building)	155-01 100 St, Howard Beach, NY 11414	N/A	0	30	5	N/A
6253	Hudson River Pumping Station/Chelsea Pumping Station	145 River Rd, Chelsea, NY 12590	N/A	0	30	5	N/A
9568	Bronx Community College Campus	185 West 180th St, Bronx, NY 10453	N/A	25	25	35	N/A
9583	York College Campus	94-20 Guy R. Brewer Blvd, Jamaica, NY 11433	N/A	20	20	60	N/A
9571	Central Office Campus	535 East 80th St, New York, NY 10075	N/A	0	0	40	N/A
7550	R435	465 New Dorp Ln, Staten Island, NY 10306	N/A	35	20	15	N/A
9908	(Q505, Q086, Q506) Campus	160-05 Highland Ave, Jamaica, NY 11432	N/A	30	15	5	N/A
7072	M480	317 East 67th St, New York, NY 10065	N/A	20	20	5	N/A
9898	(M465, M466, M965) Campus	549 Audubon Ave, New York, NY 10040	N/A	20	15	15	N/A
6950	M047	223 East 23rd St, New York, NY 10010	N/A	20	30	0	N/A
7138	Q025	34-65 192nd St, Flushing, NY 11358	N/A	20	30	0	N/A
9918	(X153, X178, X180, X181, X455, X456) Campus	650 Baychester Ave, Bronx, NY 10475	N/A	20	55	40	N/A
10558	M868	10 East 15th St, New York, NY 10003	N/A	15	15	5	N/A
6678	K240	2500 Nostrand Ave, Brooklyn, NY 11210	N/A	15	30	0	N/A
6812	K615	1 Wells St, Brooklyn, NY 11208	N/A	15	20	5	N/A
6815	K650	257 North 6th St, Brooklyn, NY 11211	N/A	15	20	5	N/A
7060	M435	260 Pleasant Ave, New York, NY 10029	N/A	15	20	5	N/A
7083	M600	225 West 24th St, New York, NY 10011	N/A	15	15	5	N/A

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7387	Q610	45-30 36th St, Long Island City, NY 11101	N/A	15	20	5	N/A
7521	R034	528 Acadeny Ave, Staten Island, NY 10307	N/A	15	30	0	N/A
7548	R075	455 Huguenot Ave, Staten Island, NY 10312	N/A	15	30	0	N/A
7712	X136	750 Jennings St, Bronx, NY 10459	N/A	15	20	0	N/A
7791	X440	100 West Mosholu Pkwy South, Bronx, NY 10468	N/A	15	15	5	N/A
9741	(K400, K401) Campus	2630 Benson Ave, Brooklyn, NY 11214	N/A	15	30	5	N/A
9743	(K420, K421) Campus	999 Jamaica Ave, Brooklyn, NY 11208	N/A	15	15	5	N/A
6804	K525	1600 Ave L, Brooklyn, NY 11230	N/A	15	35	15	N/A
9909	(R450, R451, R814) Campus	105 Hamilton Ave, Staten Island, NY 10301	N/A	15	15	5	N/A
7075	M490	122 Amsterdam Ave, New York, NY 10023	N/A	15	25	30	N/A
6802	K515	6565 Flatlands Ave, Brooklyn, NY 11236	N/A	15	20	5	N/A
6818	K660	145 Pennsylvania Ave, Brooklyn, NY 11207	N/A	15	30	5	N/A
7717	X141	660 West 237th St, Bronx, NY 10463	N/A	15	30	5	N/A
7789	X430	2780 Reservoir Ave, Bronx, NY 10468	N/A	15	15	5	N/A
9842	(R445, R815) Campus	85 St Joseph's Ave, Staten Island, NY 10302	N/A	15	30	5	N/A
9894	(X415, X416) Campus	925 Astor Ave, Bronx, NY 10469	N/A	15	15	5	N/A
9752	(K540, K541) Campus	50 Ave X, Brooklyn, NY 11223	N/A	15	20	5	N/A
6780	K430	29 Fort Greene Pl, Brooklyn, NY 11217	N/A	15	15	15	N/A
7364	Q450	28-01 41st Ave, Long Island City, NY 11101	N/A	15	30	0	N/A

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7787	X425	800 East Gun Hill Rd, Bronx, NY 10467	N/A	15	15	5	N/A
9904	(Q415, Q416, Q943) Campus	57-00 223rd St, Bayside, NY 11364	N/A	15	15	5	N/A
9905	(Q425, Q426, Q951) Campus	63-25 Main St, Flushing, NY 11367	N/A	15	15	15	N/A
6791	K470	600 Kingston Ave, Brooklyn, NY 11203	N/A	15	20	5	N/A
7163	Q053	10-45 Nameoke St, Far Rockaway, NY 11691	N/A	15	20	5	N/A
6939	M030	144-176 East 128th St, New York, NY 10035	N/A	10	20	0	N/A
6989	M113	240 West 113th St, New York, NY 10026	N/A	10	20	0	N/A
7170	Q061	98-50 50th Ave, Corona, NY 11368	N/A	10	20	5	N/A
7267	Q166	33-09 35th Ave, Astoria, NY 11106	N/A	10	30	0	N/A
7734	X158	800 Home St, Bronx, NY 10456	N/A	10	20	5	N/A
9762	(M149, M207) Campus	34 West 118th St, New York, NY 10026	N/A	10	20	5	N/A
9821	(Q226, Q923) Campus	121-10 Rockaway Blvd, South Ozone Park, NY 11420	N/A	10	15	5	N/A
9712	(K152, K927) Campus	725 East 23rd St, Brooklyn, NY 11210	N/A	10	15	5	N/A
7071	M477	345 Chambers St, New York, NY 10282	N/A	10	15	40	N/A
9749	(K490, K934) Campus	8301 Shore Rd, Brooklyn, NY 11209	N/A	10	15	15	N/A
6569	K115	1500 East 92nd St, Brooklyn, NY 11236	N/A	10	30	5	N/A
7017	M153	1750 Amsterdam Ave, New York, NY 10031	N/A	10	30	0	N/A
7664	X084	1434 Longfellow Ave, Bronx, NY 10459	N/A	10	20	5	N/A
7809	X790	730 Concourse Village West, Bronx, NY 10451	N/A	10	20	45	N/A
9830	(Q452, Q453) Campus	14-30 Broadway, Astoria, NY 11106	N/A	10	15	35	N/A
9893	(X410, X411) Campus	240 East 172nd St, Bronx, NY 10457	N/A	10	15	5	N/A

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6785	K450	850 Grand St, Brooklyn, NY 11211	N/A	10	20	5	N/A
7082	M535	525 West 50th St, New York, NY 10019	N/A	10	20	15	N/A
7430	Q620	165-65 84th Ave, Jamaica, NY 11432	N/A	10	30	5	N/A
7793	X445	75 West 205th St, Bronx, NY 10468	N/A	10	20	5	N/A
9843	(R455, R456) Campus	100 Luten Ave, Staten Island, NY 10312	N/A	10	15	15	N/A
9916	(X450, X451, X922) Campus	1980 Lafayette Ave, Bronx, NY 10473	N/A	10	15	15	N/A
7392	Q686	91-30 Metropolitan Ave, Forest Hills, NY 11375	N/A	10	20	45	N/A
9826	(Q410, Q411) Campus	100-00 Beach Channel Dr, Far Rockaway, NY 11694	N/A	10	15	5	N/A
10047	X177	3177 Webster Ave, Bronx, NY 10467	N/A	5	15	5	N/A
10108	Q290	55-20 Metropolitan Ave, Flushing, NY 11385	N/A	5	15	5	N/A
10577	Q314	88-08 164 St, Queens, NY 11432	N/A	5	15	5	N/A
10578	Q315	43-18 97th Pl, Queens, NY 11368	N/A	5	10	30	N/A
2302	K422	1065 Elton St, Brooklyn, NY 11208	N/A	5	15	5	N/A
2453	K331	7002 4th Ave, Brooklyn, NY 11209	N/A	5	20	5	N/A
2697	Q404	1-50 51 Ave, Long Island City, NY 11101	N/A	5	20	5	N/A
2876	Q585	54-40 74th St, Maspeth, NY 11378	N/A	5	15	5	N/A
3282	Q276	108-29 155th St, Jamaica, NY 11433	N/A	5	15	5	N/A
3358	R071	1050 Targee St, Staten Island, NY 10304	N/A	5	15	5	N/A
6536	K069	6302 9th Ave, Brooklyn, NY 11220	N/A	5	20	5	N/A
6667	K229	1400 Benson Ave, Brooklyn, NY 11228	N/A	5	15	5	N/A

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6761	K383	1300 Greene Ave, Brooklyn, NY 11237	N/A	5	20	5	N/A
6832	K805	49 Flatbush Ave, Brooklyn, NY 11217	N/A	5	30	5	N/A
6977	M093	501-503 West 152nd St, New York, NY 10031	N/A	5	10	10	N/A
7043	M195	625 West 133rd St, New York, NY 10027	N/A	5	15	5	N/A
7246	Q145	33-34 80th St, Flushing, NY 11372	N/A	5	15	5	N/A
7262	Q161	101-23 124th St, South Richmond Hill, NY 11419	N/A	5	20	5	N/A
7616	X034	770 Grote St, Bronx, NY 10460	N/A	5	30	0	N/A
7654	X074	730 Bryant Ave, Bronx, NY 10474	N/A	5	15	5	N/A
7659	X079	125 East 181st St, Bronx, NY 10453	N/A	5	15	5	N/A
7681	X102	1827 Archer St, Bronx, NY 10460	N/A	5	15	5	N/A
7756	X193	1919 Prospect Ave, Bronx, NY 10457	N/A	5	20	5	N/A
7770	X338	1780 Dr. Martin Luther King Jr. Blvd, Bronx, NY 10453	N/A	5	15	5	N/A
7774	X362	921 East 228th St, Bronx, NY 10466	N/A	5	20	15	N/A
9110	M488	231-249 East 56th St, New York, NY 10022	N/A	5	15	30	N/A
9679	K317	610 Baltic St, Brooklyn, NY 11217	N/A	5	15	5	N/A
9681	M338	525 West 44th St, New York, NY 10036	N/A	5	10	10	N/A
9714	(K160, K521) Campus	5105 Fort Hamilton Pkwy, Brooklyn, NY 11219	N/A	5	15	5	N/A
9756	(M005, M921) Campus	3703 10th Ave, New York, NY 10034	N/A	5	15	5	N/A
9790	(Q070, Q970) Campus	30-45 42nd St, Long Island City, NY 11103	N/A	5	15	5	N/A
9920	Q515	149-11 Melbourne Ave, Flushing, NY 11367	N/A	5	15	5	N/A

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6533	K066	845 East 96th St, Brooklyn, NY 11236	N/A	5	25	5	N/A
7403	Q744	45-10 94th St, Flushing, NY 11373	N/A	5	20	20	N/A
7543	R058	77 Marsh Ave, Staten Island, NY 10314	N/A	5	20	5	N/A
7324	Q230	34-01 73rd St, Jackson Heights, NY 11372	N/A	5	15	5	N/A
6480	K002	655 Parkside Ave, Brooklyn, NY 11226	N/A	5	25	5	N/A
6739	K314	330 59th St, Brooklyn, NY 11220	N/A	5	15	5	N/A
6765	K395	1001 East 45th St, Brooklyn, NY 11203	N/A	5	15	5	N/A
6827	K798	696 Jamaica Ave, Brooklyn, NY 11208	N/A	5	15	5	N/A
6990	M114	331 East 91st St, New York, NY 10128	N/A	5	10	10	N/A
7337	Q260	40-20 100th St, Corona, NY 11368	N/A	5	15	5	N/A
7340	Q266	74-10 Commonwealth Blvd, Jamaica, NY 11426	N/A	5	20	5	N/A
7393	Q690	116-01 Guy R. Brewer Blvd, Jamaica, NY 11434	N/A	5	15	15	N/A
7500	R006	555 Page Ave, Staten Island, NY 10307	N/A	5	15	5	N/A
7541	R056	250 Kramer Ave, Staten Island, NY 10309	N/A	5	20	5	N/A
7754	X189	3441 Steenwick Ave, Bronx, NY 10475	N/A	5	20	15	N/A
7757	X194	1301 Zerega Ave, Bronx, NY 10462	N/A	5	15	5	N/A
7768	X279	2100 Walton Ave, Bronx, NY 10453	N/A	5	15	5	N/A
7775	X368	2975 Tibbett Ave, Bronx, NY 10463	N/A	5	20	5	N/A
7798	X460	244 East 163rd St, Bronx, NY 10451	N/A	5	15	5	N/A
7799	X465	4143 Third Ave, Bronx, NY 10457	N/A	5	10	20	N/A

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9748	(K485, K977) Campus	350 67th St, Brooklyn, NY 11220	N/A	5	15	5	N/A
9851	(X020, X931) Campus	3050 Webster Ave, Bronx, NY 10467	N/A	5	15	15	N/A
6722	K291	231 Palmetto St, Brooklyn, NY 11221	N/A	5	20	5	N/A
6753	K356	104 Sutter Ave, Brooklyn, NY 11212	N/A	5	15	5	N/A
6807	K564	153 35th St, Brooklyn, NY 11232	N/A	5	15	30	N/A
6975	M090	21 Jumel Pl, New York, NY 10032	N/A	5	20	5	N/A
7002	M130	143 Baxter St, New York, NY 10013	N/A	5	30	0	N/A
7069	M470	145 West 84th St, New York, NY 10024	N/A	5	35	5	N/A
7121	Q007	80-55 Cornish Ave, Flushing, NY 11373	N/A	5	30	5	N/A
7167	Q058	72-24 Grand Ave, Flushing, NY 11378	N/A	5	30	5	N/A
7305	Q208	74-30 Commonwealth Blvd, Jamaica, NY 11426	N/A	5	20	5	N/A
7321	Q227	32-02 Junction Blvd, Flushing, NY 11369	N/A	5	30	5	N/A
7330	Q239	17-15 Weirfield St, Ridgewood, NY 11385	N/A	5	20	5	N/A
7336	Q254	84-40 101st St, Jamaica, NY 11418	N/A	5	30	5	N/A
7341	Q268	92-07 175th St, Jamaica, NY 11433	N/A	5	15	5	N/A
7342	Q270	233-15 Merrick Blvd, Jamaica, NY 11422	N/A	5	20	5	N/A
7381	Q499	148-20 Reeves Ave, Flushing, NY 11367	N/A	5	20	5	N/A
7384	Q566	74-20 Common Wealth Blvd, Jamaica, NY 11426	N/A	5	15	15	N/A
7389	Q650	94-06 104th St, Jamaica, NY 11416	N/A	5	15	15	N/A
7394	Q695	160-20 Goethals Ave, Jamaica, NY 11432	N/A	5	15	15	N/A
7396	Q721	41-15 104th St, Flushing, NY 11368	N/A	5	15	20	N/A

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7426	Q849	976 Seneca Ave, Ridgewood, NY 11385	N/A	5	30	5	N/A
7695	X116	977 Fox St, Bronx, NY 10459	N/A	5	15	5	N/A
7769	X306	40 West Tremont Ave, Bronx, NY 10453	N/A	5	25	5	N/A
7843	X884	350 Gerard Ave, Bronx, NY 10451	N/A	5	15	5	N/A
9702	(K007, K991) Campus	858 Jamaica Ave, Brooklyn, NY 11208	N/A	5	25	5	N/A
9745	(K445, K446) Campus	1601 80th St, Brooklyn, NY 11214	N/A	5	15	5	N/A
9759	(M048, M902) Campus	4360 Broadway, New York, NY 10033	N/A	5	15	5	N/A
9789	(Q069, Q869) Campus	77-02 37th Ave, Jackson Heights, NY 11372	N/A	5	20	5	N/A
7753	X184	778 Forest Ave, Bronx, NY 10456	N/A	5	30	0	N/A
6695	K259	7305 Fort Hamilton Pkwy, Brooklyn, NY 11228	N/A	5	15	5	N/A
6937	M025	145 Stanton St, New York, NY 10002	N/A	5	20	5	N/A
6973	M088	215 West 114th St, New York, NY 10026	N/A	5	15	15	N/A
7003	M131	100 Hester St, New York, NY 10002	N/A	5	15	5	N/A
7058	M276	55 Battery Pl, New York, NY 10280	N/A	5	15	5	N/A
7086	M625	439 West 49th St, New York, NY 10019	N/A	5	30	5	N/A
7097	M834	444 West 56th St, New York, NY 10019	N/A	5	15	5	N/A
7120	Q005	50-40 Jacobus St, Flushing, NY 11373	N/A	5	35	15	N/A
7211	Q108	108-10 109th Ave, South Ozone Park, NY 11420	N/A	5	15	5	N/A
7327	Q234	30-15 29th St, Astoria, NY 11102	N/A	5	20	5	N/A
7339	Q263	222-14 Jamaica Ave, Jamaica, NY 11428	N/A	5	5	25	N/A

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7386	Q600	37-02 47th Ave, Long Island City, NY 11101	N/A	5	15	5	N/A
7397	Q722	57-12 94th St, Elmhurst, NY 11373	N/A	5	20	5	N/A
7547	R072	33 Ferndale Ave, Staten Island, NY 10314	N/A	5	20	5	N/A
7577	R861	280 Regis Dr, Staten Island, NY 10314	N/A	5	15	5	N/A
7599	X015	2195 Andrews Ave, Bronx, NY 10453	N/A	5	15	5	N/A
7752	X183	339 Morris Ave, Bronx, NY 10451	N/A	5	15	5	N/A
9844	(R460, R461) Campus	1200 Manor Rd, Staten Island, NY 10314	N/A	5	15	15	N/A
9888	(X151, X156) Campus	250 East 156th St, Bronx, NY 10451	N/A	5	25	30	N/A
9915	(X420, X421, X423) James Monroe Campus	1300 Boynton Ave, Bronx, NY 10472	N/A	5	20	15	N/A
6675	K237	50 Ave P, Brooklyn, NY 11204	N/A	5	15	20	N/A
7057	M271	645 Main St, New York, NY 10044	N/A	5	10	35	N/A
7334	Q247	69-10 65th Dr, Middle Village, NY 11379	N/A	5	15	5	N/A
9828	(Q430, Q966) Campus	58-20 Utopia Pkwy, Fresh Meadows, NY 11365	N/A	5	15	15	N/A
6809	K590	1186 Carroll St, Brooklyn, NY 11225	N/A	5	15	5	N/A
7529	R043	100 Essex Dr, Staten Island, NY 10314	N/A	5	20	35	N/A
328	Hunter College High School	71 East 94th St, New York, NY 10128	N/A	5	15	5	N/A
6738	K313	283 Adams St, Brooklyn, NY 11201	N/A	5	15	10	N/A
7127	Q013	55-01 94th St, Flushing, NY 11373	N/A	5	15	5	N/A
7206	Q102	55-24 Van Horn St, Elmhurst, NY 11373	N/A	5	15	5	N/A
7238	Q137	109-15 98th St, Jamaica, NY 11417	N/A	5	20	5	N/A

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7335	Q253	13-07 Central Ave, Far Rockaway, NY 11691	N/A	5	15	5	N/A
9782	(Q043, Q920) Campus	160 Beach 29th St, Far Rockaway, NY 11691	N/A	5	15	5	N/A
6820	K722	64 Ave X, Brooklyn, NY 11223	N/A	0	20	5	N/A
6782	K440	883 Classon Ave, Brooklyn, NY 11225	N/A	0	15	5	N/A
6745	K324	800 Gates Ave, Brooklyn, NY 11221	N/A	0	15	5	N/A
7886	X970	1595 Bathgate Ave, Bronx, NY 10457	N/A	0	10	20	N/A
9917	(X475, X476, X960) Campus	99 Terrace View Ave, Bronx, NY 10463	N/A	0	20	15	N/A
7763	X229	275 Harlem River Park Bridge, Bronx, NY 10453	N/A	0	15	15	N/A
7713	X137	22-25 Webster Ave, Bronx, NY 10457	N/A	0	15	15	N/A
7027	M169	110 East 88th St, New York, NY 10128	N/A	0	15	5	N/A
4614	Mid-Manhattan Library	455 5th Ave, New York, NY 10016	N/A	40	10	20	N/A
4629	The Library for the Performing Arts	40 Lincoln Center Plz, New York, NY 10023	N/A	10	0	50	N/A
231	Central Library and Learning Center	10 Grand Army Plz, Brooklyn, NY 11238	N/A	5	20	20	N/A
4692	New York Hall of Science	47-01 111th St, Corona, NY 11368	N/A	5	15	15	N/A
4430	The Cloisters (Metropolitan Museum of Art)	799 Ft Washington Ave, New York, NY 10040	N/A	0	5	35	N/A
4426	Museum of Jewish Heritage	36 Battery Pl, New York, NY 10280	N/A	0	15	20	N/A
7411	Q801	44-36 Vernon Blvd, Long Island City, NY 11101	N/A	5	25	30	N/A
4569	Building Maintenance Quartermaster	59-06 Laurel Hill Blvd, Woodside, NY 11377	N/A	20	10	20	N/A
3879	Administrative Offices	44 Beaver St, New York, NY 10004	N/A	15	20	5	N/A
1035	Bronx County Hall of Justice	265 East 161st St, Bronx, NY 10451	N/A	15	35	45	N/A

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9578	Medgar Evers College Campus	1150 Carroll St, Brooklyn, NY 11225	8.7	40	25	35	\$6,619
10559	M912	521 West 43rd St, New York, NY 10036	9.0	5	15	15	\$10,130
1113	Fort Washington Armory-Shelter (Project Renewal)	216 Ft Washington Ave, New York, NY 10032	9.1	10	15	20	\$10,124
9575	Kingsborough Community College Campus	2055 Oriental Blvd, Brooklyn, NY 11235	9.3	45	60	45	\$6,622
5620	Hunts Point Market	Bay Ave at Halleck St, Bronx, NY 10474	9.3	10	15	30	\$10,128
4305	North Central Bronx Hospital	3424 Kossuth Ave, Bronx, NY 10467	9.4	50	45	60	\$5,792
9616	Rockaway WPCP Campus	106-21 Beach Channel Dr, Rockaway Park, NY 11694	9.4	50	10	65	\$6,619
9590	Brooklyn Botanical Garden Campus	1000 Washington Ave, Brooklyn, NY 11225	9.5	10	10	20	\$10,128
9919	Petrides Complex Campus	715 Ocean Ter, Staten Island, NY 10301	9.6	15	20	15	\$9,584
9580	Queens College Campus	65-90 Kissena Blvd, Flushing, NY 11367	9.7	55	60	65	\$5,916
9601	Jacobi Medical Center Campus	1400 Pelham Pkwy South, Bronx, NY 10461	9.9	60	55	80	\$5,851
9621	Flushing Meadows Corona Park Campus	131-00 Avery Ave, Flushing, NY 11355	9.9	10	10	20	\$10,126
9084	Henry J. Carter Hospital	1879 Madison Ave, New York, NY 10035	10.1	35	15	55	\$6,618
9591	New York Botanical Garden Campus	2900 Southern Blvd, Bronx, NY 10458	10.1	35	20	35	\$6,619
9632	Police Academy	130-30 28th Ave, College Point, NY 11354	10.3	45	20	60	\$6,620
4327	Woodhull Medical and Mental Health Center	760 Broadway, Brooklyn, NY 11206	10.4	50	55	65	\$7,947
1009	100 Gold Street Office Building	100 Gold St, New York, NY 10038	10.6	15	35	35	\$8,490
206	Brooklyn Museum	200 Eastern Pkwy, Brooklyn, NY 11238	10.7	40	25	45	\$6,616
9564	Queens Borough Hall Campus	25-01 Queens Blvd, Forest Hills, NY 11415	10.8	35	35	45	\$5,887

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9563	Manhattan Criminal Court Campus	138-40 Centre St, New York, NY 10013	11.3	45	50	55	\$5,216
6790	K465	911 Flatbush Ave, Brooklyn, NY 11226	11.3	20	15	5	\$8,063
4575	NYPD Police Laboratory	150-14 Jamaica Ave, Jamaica, NY 11432	11.4	15	20	35	\$9,526
9581	Queensborough Community College Campus	220-09 56th Ave, Bayside, NY 11364	11.6	50	20	45	\$8,341
3823	Queens Museum of Art	52-01 Grand Central Parkway, Corona, NY 11368	12.1	10	10	35	\$10,130
3950	Queens West 2,3,4 District Garages; Central Repair Shop	52-35 58th St, Flushing, NY 11377	12.2	55	15	40	\$10,124
9921	Croton Water Treatment Plant	3701 Jerome Ave, Bronx, NY 10467	12.3	55	30	55	\$8,336
3531	Asphalt Green Recreation Facility	1750 York Ave, New York, NY 10128	12.5	20	5	35	\$14,136
9625	Brooklyn Criminal Court Campus	120 Schermerhorn St, Brooklyn, NY 11201	12.6	45	20	45	\$6,620
10224	Public Safety Answering Center II	350 Marconi St, Bronx, NY 10461	13.2	35	25	50	\$8,693
1033	Bronx County Courthouse	851 Grand Concourse, Bronx, NY 10451	13.5	5	25	15	\$2,927
9604	Elmhurst Hospital Center Campus	79-01 Broadway, Flushing, NY 11373	13.5	55	55	65	\$5,679
9631	Henry J. Carter Hospital - Skilled Nursing Facility	1752 Park Ave, New York, NY 10035	13.6	5	10	35	\$10,121
9570	College of Staten Island Campus	2800 Victory Blvd, Staten Island, NY 10314	14.6	25	60	55	\$10,123
4756	Queens Central Library	89-11 Merrick Blvd, Jamaica, NY 11432	15.0	15	5	60	\$10,128
3478	Staten Island Ferry Terminal (Whitehall)	4 South St, New York, NY 10004	15.1	25	10	45	\$10,131
9611	Newtown Creek WPCP Campus	329 Greenpoint Ave, Brooklyn, NY 11222	15.2	75	25	95	\$5,857
9617	Tallman Island WPCP Campus	127-01 Powells Cove Blvd, College Point, NY 11356	15.6	50	10	70	\$6,473
49	Museum of the Moving Image	36-01 35th Ave, Astoria, NY 11106	15.7	10	5	35	\$10,121

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4306	Manhattan 3 District Garage	280-284 South St, New York, NY 10002	N/A	15	15	25	N/A
3943	Cioffe Borough Repair Shop	10601 Ave D, Brooklyn, NY 11236	N/A	15	20	5	N/A
4245	Transportation Repair Shop	48-67 34th St, Long Island City, NY 11101	N/A	10	10	20	N/A
3504	North Fleet Depot (Harper St. Yard Facility)	32-11 Harper St, Flushing, NY 11368	N/A	5	15	5	N/A
3966	Richmond Boro Repair Shop / SI 3 District Garage	60 Muldoon Ave, Staten Island, NY 10314	N/A	5	15	5	N/A
3953	Queens Borough Repair Shop	52-07 58th St, Flushing, NY 11377	N/A	5	15	5	N/A
3520	Ferry Maintenance Shop	5 Bay St, Staten Island, NY 10301	N/A	5	5	25	N/A
3894	Manhattan Borough Repair Shop	640 West 26th St, New York, NY 10001	N/A	5	20	15	N/A
10262	FIT Campus: Kaufman Hall Dormitory	406 West 31st St, New York, NY 10001	N/A	5	15	30	N/A
3566	Icahn Stadium	20 Randall's Island, New York, NY 10035	N/A	5	20	0	N/A
5440	Homeport	355 Front St, Staten Island, NY 10304	N/A	N/A	N/A	N/A	N/A
3982	Passenger Ship Terminal	711 12th Ave, New York, NY 10019	N/A	10	25	30	N/A
3542	Central Park Campus: Central Park Zoo - Penguin Building	5th Ave at East 65th St, New York, NY 10065	N/A	5	5	45	N/A
10203	Ocean Breeze Indoor Athletic Facility	625 Father Capodanno Blvd, Staten Island, NY 10305	N/A	5	5	35	N/A
3628	Central Park Campus: Wollman Rink	Mid Central Park at 65th St, New York, NY 10023	N/A	5	15	5	N/A
3865	Staten Island War Memorial Ice Rink	1321 Victory Blvd, Staten Island, NY 10301	N/A	5	15	20	N/A

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