

NOTICE OF REQUEST FOR INFORMATION REGARDING

INNOVATIVE SOLAR PHOTOVOLTAIC
APPLICATIONS AT NEW YORK CITY
WASTEWATER TREATMENT PLANTS

PIN #:85617RFI002



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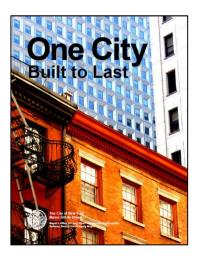
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INTRODUCTION

The City of New York (the "City"), acting through the Department of Citywide Administrative Services ("DCAS"), and in partnership with the Department of Environmental Protection ("DEP"), is issuing this Request for Information ("RFI") to identify innovative applications of solar photovoltaic ("PV") systems to supply clean renewable electricity to wastewater treatment plants ("WWTPs") owned by the City and operated by DEP. With this RFI, the City seeks to identify the opportunities and challenges to innovative approaches to building solar PV systems at City-owned WWTPs.

The City has an established history of promoting the development and use of renewable, zero carbon energy and reducing greenhouse gas ("GHG") emissions. As outlined in the <u>One City: Built to Last</u> plan, the City's own portfolio of buildings can serve as models for



sustainability, with the goal of reducing GHG emissions from energy use across government-owned buildings 35 percent by 2025. A key component of this plan is to expand PV systems in operation at various City facilities, with the objective of reaching 100 MW of installed PV capacity by 2025. The DCAS Division of Energy Management ("DEM") coordinates with City agencies to identify buildings and other facilities across the 5 boroughs suitable to host PV systems, as well as developing long-term strategies to maximize PV installations.

The objective of this RFI is to identify opportunities to build PV systems at the City's WWTPs, where energy consumption is high but available space for rooftop PV systems is limited. DEP's facilities represent a significant footprint of the City's property, with 14 in-city WWTPs operating across New York City, totaling an aggregate of 20 million sq. ft. These 14 facilities alone account for 17% of the City's total electricity consumption. The electric demand at each of the WWTPs, on average, ranges from 1.5 to 18 MW. While DEP has implemented various energy conservation measures at these facilities, including hosting the largest rooftop PV system at a City-owned facility to date at the Port Richmond WWTP in Staten Island (1.2 MW), identifying opportunities for similarly scaled PV systems at the remaining 13 plants requires additional investigations, as they lack a similarly sized roof as that at the Port Richmond plant.

DEM and DEP are seeking information on innovative methods of developing large-scale PV systems at large WWTPs. These methods could include PV racking/canopies built on roofs, parking lots, vacant lands, and/or over the plant's various tanks and equipment, while ensuring that their placement and operations do not disrupt the safety, operations, and maintenance of the WWTP. The City seeks responses from all entities involved in and supporting the solar PV sector, such as developers, installers, and financial institutions. The City is open to receiving responses from single entities or from entities that represent multi-ventures that could provide creative solutions to deliver reliable and cost-effective projects designed to maximize installed solar PV at WWTPs.



PURPOSE OF THE RFI

The purpose of this RFI is to gather information about the opportunities and challenges of developing large-scale solar PV systems at the City's wastewater treatment plants. The City's largest rooftop solar installation to date (1.2 MW) at the Port Richmond Wastewater Treatment Plant is on a 200,000 square foot roof of a building that houses a treatment process area and aeration tanks. The remaining thirteen (13) DEP owned and operated WWTPs lack similarly sized and structured rooftops, with outdoor tanks for various treatment processes taking up the majority of the plants' footprints.

The City is seeking high-level assessments or descriptions of potential solar PV systems at the specified WWTPs with PV racking/canopies built on rooftops, unused vacant land, parking lots, and/or space over process treatment tanks and/or other plant equipment through use of platforms/canopies or other structures to support a solar PV array. All methods must ensure that their placement and operations do not disrupt the safety, operations, and maintenance of the WWTP, and must take into account impacts on the local community. Various examples of existing solar PV systems built at wastewater treatment facilities utilizing these methods may be referenced to assess their replicability at City owned WWTPs. Examples of similar projects that respondents may refer to are contained in Appendix C of this RFI. Please note that the City does not endorse any specific project, vendor, system, or method in issuing this RFI.

Responses to the RFI should include information on the opportunities and challenges for these solar PV installation methods, as well as any structural requirements for each type of suggested technology/system, operations and maintenance requirements, and market interests. In particular, the City would like to gain an understanding of the following:

- A. The potential installed capacity (kW-DC) for solar PV across the <u>City's portfolio of in-city WWTPs</u>.
 - Responses should include assessments for at least, but necessarily not limited to, the following three WWTPs, for which site visits will be arranged (see "Submission Process"):
 - 26th Ward WWTP
 - Newtown Creek WWTP
 - Wards Island WWTP
- B. Designs and approaches that could be implemented at the City's WWTPs to maximize solar PV system capacity, without jeopardizing plant safety, and any current or future operations and maintenance.
- C. The overall opportunities and challenges of implementing the potential solar PV systems, including but not limited to:
 - Technical barriers and potential solutions
 - Regulatory considerations
 - Costs
 - Operations and Maintenance requirements
 - Project timelines
 - Design elements



CITY OBJECTIVES

The City's objectives are:

- A. Install 100 MW of solar PV capacity on City owned buildings and property by 2025.
- B. Install megawatt-scale solar PV systems on all City properties of ample size with minimal impact to these properties' functionalities and regular operations and maintenance work.
- C. Reduce greenhouse gas emissions 35% (from 2005 levels) from municipal operations by 2025.
- D. Support the goal of reducing citywide greenhouse gas emissions 80% by 2050.
- E. Support of the goal of achieving net-zero energy use at the WWTPs by 2050 in a cost-effective manner.

SUBMISSION REQUIREMENTS

A complete response will include the following components:

A. Executive Summary

Responses should include an Executive Summary which briefly describes the respondent and the key findings and features of the response, including an overall summary of the potential installed PV capacity and production at each assessed WWTP, GHG reduction potential, method(s) of installation, pricing structures, terms, and any identified or anticipated challenges. Responses with different scenarios (i.e. different capacities) are also welcomed.

B. Description and Experience of Respondent

Responses should provide a description of the respondent's experience in the solar PV/renewable energy field, descriptions of any relevant experience involving solar PV systems at wastewater treatment plants or similar facilities, and a summary of any other relevant experience involving similar projects and/or services. Include size of installations and how development challenges, if any, were overcame. Responses should also provide contact information including legal business name and address, website, and the name, telephone, and email address of a representative associated with the response.

C. Solar PV Systems

Responses should include a description of the solar PV system that could be feasible at each WWTP, or at the plant(s) that are most attractive to the respondent. Site maps detailing the location and boundaries of each WWTP are included in Appendix A. The City will host site visits at three WWTPs to inform responses, during which the current plant configuration and relevant future alterations to the plant campus will be explained. It is requested that responses for these three sites are provided, at a minimum (see "Submission Process" for more details). These will include:

• 26th Ward WWTP



- Newtown Creek WWTP
- Wards Island WWTP

The description should, at a minimum, include the location of the solar arrays, the potential attachment methods (e.g. ground-mounted, canopy, etc.), the estimated installed capacity (kW-DC), potential PV module technology (construction type, make/model, wattage, efficiency) and the annual GHG reduction potential (please refer to the Appendix for GHG coefficient). Responses should also include a narrative on the overall feasibility of the approach described in the response to the RFI, indicating any potential technical barriers to address. Responses must include maps of WWTPs where PV could be installed, along with preliminary layouts of the PV arrays, the respective installed capacities, and details of the potential attachment methods. Responses must also include details on any applicable operations and maintenance requirements.

D. Regulatory Considerations

Responses should identify any known local or state regulatory requirements unique to the solar PV system described in the response, or any other regulatory considerations which may impact the feasibility of the system. This may include Building and Fire Codes, environmental impact compliance, utility regulations, and any other regulatory compliance beyond those required for typical solar PV.

E. Timeline

Responses should include a high-level estimated timeline for completion of the solar PV system described in the response. This at a minimum should include an assessment of the duration of the solar PV system's installation timeline, from start through completion. The expected duration of key phases should be indicated as well, such as design, regulatory/utility approvals, construction and commissioning phases.

F. Financial and Contractual Information

Responses should include any preliminary cost estimates or financing options associated with the solar PV system described in the response. This includes estimated installed cost of the solar PV system (broken down by PV module costs, racking and any structural supports costs, and all other balance of system/soft costs); the potential pricing per installed kilowatt (kW) of the solar PV system, and/or potential rates per kilowatt hour (kWh) with any potential terms for a power purchase agreements (PPA) or other third-party ownership models with no upfront costs to the City. Any federal, state or local incentives to be leveraged may be indicated as well.

G. Other Issues to Address

Respondents may use their experience and expertise to address any additional issues relevant to installing solar PV systems at WWTPs using the methods described in this RFI. These issues may include, but not be limited to:

- 1. Any concerns regarding PV system interconnection to the utility grid, technical or regulatory, given potential system size.
- 2. Any impacts to WWTP processes and operations during PV system construction.



- 3. Any impacts to WWTP processes and operations during PV system operation (i.e. impacts, if any, on the wastewater treatment processes due to the presence of the PV system).
- 4. Any potential concerns unique to WWTP conditions, including corrosion or other damage to the PV system (modules, racking and mounting system) due to exposure to the plant's processing of wastewater.
- 5. Any safety concerns to WWTP personnel and construction crews during PV system construction and/or operation.
- 6. Any operations and maintenance considerations.
- 7. Any other critical information that should be included as part as the response to this RFI.

SUBMISSION PROCESS

Respondents will have the ability to email questions regarding any aspect of this RFI; questions and general inquiries are to be submitted to solar@dcas.nyc.gov by 5:00pm EST, Friday November 4th, 2016. Responses to questions and inquiries will be posted to the DCAS Energy Management website by Friday, November 18th, 2016: http://www.nyc.gov/html/dem/html/home/home.shtml

Site visits to three WWTPs will be scheduled for prospective respondents to tour the plants as an opportunity to inform their responses. Respondents are encouraged, but not required, to attend at least one, or up to three, of the site visits. Interested parties must register to attend by contacting solar@dcas.nyc.gov by 5:00 PM EST, Friday October 14th, 2016; RSVPs must include names and organizations of attendees per each site visit. Site visits will occur as per the following:

- 26th Ward WWTP: Friday, October 21st, 2016 at 10:00am
- Wards Island WWTP: Monday, October 24th, 2016 at 10:00am
- Newtown Creek WWTP: Wednesday, October 26th, 2016 at 10:00am

Responses in Adobe PDF format are due electronically to the email <u>solar@dcas.nyc.gov</u> below by 5:00 PM EST on Tuesday, December 13th, 2016. Any tables should be sent in MS Excel format.

RFI Contact:

Department of Citywide Administrative Services Attention: Luke Clause Clean Energy Resources Program Manager E-Mail: solar@dcas.nyc.gov



ADDITIONAL INFORMATION

Costs and Expenses

The City shall not have any responsibility for any costs or expenses incurred by any respondent related to its preparation of a response to this RFI. Each respondent is solely responsible for its own costs and expenses in preparing and submitting a response to this RFI and participating in the RFI process, including the provision of any additional information or attendance at meetings or interviews.

No Binding Obligation Is Created

This document is not intended as a solicitation for the award of a contract, nor a prerequisite or preclusion for participation in any future solicitation. The City is under no legal, monetary, or contractual obligation to respondents to this RFI. This RFI, and any documents submitted in response thereto, do not constitute and will not give rise to any legally binding obligation on the part of the City. The City does not intend to, and shall not be, bound by the terms of this RFI. The City reserves the right to proceed in any matter that it, in its sole discretion, deems appropriate. The City also reserves the right to accept and consider any non-compliant response. All responses to this RFI shall become the property of the City.

Reservation of Rights

The City reserves the right, at its sole discretion, to alter and/or withdraw the RFI at any time; to choose to discuss various approaches with one or more respondents (including those not responding to the RFI); to use the ideas or approaches submitted in any manner deemed to be in the best interests of the City, including but not limited to soliciting competitive submissions relating to such ideas or approaches; and/or undertake the prescribed work in a manner other than that which is set forth herein.

Confidentiality

The names of the respondents to this RFI shall not be confidential. However, subject to the provisions of applicable law, at the request of any respondent, the contents of the response, or any portion thereof, may be treated as confidential. Any request to treat a response or portion thereof as confidential should be accompanied by an explanation justifying the applicability of the protection sought.



Appendix A: Wastewater Treatment Plant Site Maps.

Responses should include a description of the solar PV system that could be feasible at each WWTP, or at the plant(s) that are most attractive to the respondent. Site maps detailing the location and boundaries of each WWTP are included in the following Appendix. It is requested that responses for three of these sites are provided, at a minimum (see "Submission Process" for more details). These include:

- 26th Ward WWTP
- Newtown Creek WWTP
- Wards Island WWTP

Please note that the North River WWTP is excluded from this RFI, and is not included in the following site maps.

To request higher resolution images, please email solar@dcas.nyc.gov.



26th Ward Wastewater Treatment Plant



Coordinates: 73°52'40.087"W 40°39'2.174"N Total Parcel Square Footage: 1,996,074 sq-ft



This map was created as an attachment to the Notice of Request for Information Regarding Innovative Solar Photovoltaic Applications at New York City Wastewater Treatment Plants as issued by the NYC Department of Citywide Administrative Services. PIN#: 85617RFI002.

Please note that the NYC Department of Environmental Protection makes no representations or warranties, express or implied, as to the quality, accuracy, completeness or reliability of the referenced data disclosed hereunder and is not liable for any damages, direct or indirect, sustained as a result of the use of, or reliance upon, any of such data. Neither DEP nor any of its officers or employees shall have any liability whatsoever with respect to the use of, or reliance upon, the data by the recipient or any third party.



0 500 1,000 Feet

DEP-Owned Parcel Boundaries

Bowery Bay Wastewater Treatment Plant



Address: 43-01 Berrian Blvd. Astoria, NY 11105 Coordinates: 73°53'38.681"W 40°46'48.508"N Total Parcel Square Footage: 1,590,331 sq-ft

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Parcel and Streetname Data Source: NYC Department of City Planning PLUTO 16v1 and LION 16A (2016) Satellite Imagery Data Source: NYC Department of Information Technology & Telecommunication (2014)

DEP-Owned Parcel Boundaries

Credit: NYC DEP Energy Office

Coney Island Wastewater Treatment Plant

Environmental Protection

Address: 2591 Knapp St. Brooklyn, NY 11235 Coordinates: 73°55'59.228"W 40°35'24.745"N Total Parcel Square Footage: 1,309,527 sq-ft

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0 280 560 Feet DEP-Owned Parcel Boundaries Map Created: 6/9/2016 Credit: NYC DEP Energy Office

Hunts Point Wastewater Treatment Plant



Address: 1270 Ryawa Ave. Bronx, NY 10474 Coordinates: 73°52'52.280"W 40°48'13.471"N Total Parcel Square Footage: 1,993,593 sq-ft

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0 480 960 Feet DEP-Owned Parcel Boundaries Map Created: 6/9/2016 Credit: NYC DEP Energy Office

Jamaica Wastewater Treatment Plant

Address: 150-20 134th St. Jamaica, NY 11430 Coordinates: 73°48'32.839"W 40°39'45.353"N Total Parcel Square Footage: 1,407,818 sq-ft



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0 250 500 Feet DEP-Owned Parcel Boundaries Map Created: 6/9/2016 Credit: NYC DEP Energy Office

Newtown Creek Wastewater Treatment Plant



Address: 329 Greenpoint Ave. Brooklyn, NY 11222 Coordinates: 73°56'47.825"W 40°44'2.342"N Total Parcel Square Footage: 2,249,526 sq-ft

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0 375 750 Feet

DEP-Owned Parcel Boundaries

Oakwood Beach Wastewater Treatment Plant



Address: 751 Mill Rd. Staten Island, NY 10306 Coordinates: 74°7'0.667"W 40°33'4.936"N Total Parcel Square Footage: 1,142,776 sq-ft

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0 300 600 Feet DEP-Owned Parcel Boundaries Map Created: 6/9/2016 Credit: NYC DEP Energy Office

Owl's Head Wastewater Treatment Plant



Address: 6700 Shore Rd. Brooklyn, NY 11220 Coordinates: 74°2'1.550"W 40°38'30.667"N Total Parcel Square Footage: 1,056,763 sq-ft

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0 300 600 Feet DEP-Owned Parcel Boundaries Map Created: 6/9/2016 Credit: NYC DEP Energy Office

Port Richmond Wastewater Treatment Plant



Address: 1801 Richmond Terr. Staten Island, NY 10310

Coordinates: 74°7'27.674"W 40°38'21.757"N Total Parcel Square Footage: 886,106 sq-ft

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0 255 510 Feet DEP-Owned Parcel Boundaries Map Created: 6/9/2016 Credit: NYC DEP Energy Office

Red Hook Wastewater Treatment Plant



Address: 63 Flushing Ave. Brooklyn, NY 11205 Coordinates: 73°58'43.349"W 40°42'14.231"N Total Parcel Square Footage: 643,168 sq-ft

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0 235 470 Feet

DEP-Owned Parcel Boundaries

Rockaway Wastewater Treatment Plant

Address: 106-21 Beach Channel Dr. Rockaway, NY 11694

Coordinates: 73°49'42.323"W 40°35'1.633"N Total Parcel Square Footage: 549,418 sq-ft



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0 225 450 Feet DEP-Owned Parcel Boundaries Credit:

Tallman Island Wastewater Treatment Plant



Address: 127-01 Powells Cove Blvd. College Point, NY 11356

Coordinates: 73°50'21.361"W 40°47'41.323"N Total Parcel Square Footage: 1,295,433 sq-ft

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0 262.5 525 Feet

DEP-Owned Parcel Boundaries

Wards Island Wastewater Treatment Plant



Address: Wards Island New York, NY 10035 Coordinates: 73°55'18.347"W 40°47'14.741"N Total Parcel Square Footage: 3,023,582 sq-ft

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0 460 920 Feet DEP-Owned Parcel Boundaries Map Created: 6/9/2016 Credit: NYC DEP Energy Office

Appendix B: Wastewater Treatment Plant Energy Demand, Cost Summary, GHG Coefficient

This table was created as an attachment to the Notice of Request for Information Regarding Innovative Solar Photovoltaic Applications at New York City Wastewater Treatment Plants as issued by the NYC Department of Citywide Administrative Services, PIN#: 85617RFI002

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	1	NVC GHG Emissions Coo	fficient per kWh Formula	0 0002062 Mg CO2 * kWh	1	
	l	NYC GHG Emissions Coefficient per kWh Formula 0.0003063 Mg CO2 * kWh		1		
		Assumed Facility Footprint		nd (Weekdays, 8:00am-6:00pm)	Utility Electricity Consumption	Utility Electricity Price
			FY16 Average kW	FY16 Maximum kW	FY16 Total kWh	FY16 Blended \$ / kWh
Con Edison Territory						
26th Ward WWTP	122-66 Flatlands Ave. Brooklyn, NY 11207	1,996,074 sq-ft	4,075 kW	5,558 kW	35,877,897 kWh	
Bowery Bay WWTP	43-01 Berrian Blvd. Astoria, NY 11105	1,590,331 sq-ft	5,983 kW	7,693 kW	52,332,800 kWh	
Coney Island WWTP	2591 Knapp St. Brooklyn, NY 11235	1,309,527 sq-ft	3,822 kW	5,913 kW	33,628,800 kWh	
Hunts Point WWTP	1270 Ryawa Ave. Bronx, NY 10474	1,993,593 sq-ft	7,033 kW	9,363 kW	63,645,080 kWh	
Jamaica WWTP	150-20 134th St. Jamaica, NY 11430	1,407,818 sq-ft	4,342 kW	5,633 kW	38,352,000 kWh	
Newtown Creek WWTP	329 Greenpoint Ave. Brooklyn, NY 11222	2,249,526 sq-ft	14,459 kW	18,596 kW	128,013,180 kWh	0.08146 \$/kWh
Oakwood Beach WWTP	751 Mill Rd. Staten Island, NY 10306	1,142,766 sq-ft	2,439 kW	3,430 kW	21,609,600 kWh	
Owl's Head WWTP	6700 Shore Rd. Brooklyn, NY 11220	1,056,763 sq-ft	3,753 kW	5,852 kW	34,521,600 kWh	
Port Richmond WWTP	1801 Richmond Terr. Staten Island, NY 10310	886,106 sq-ft	2,288 kW	3,253 kW	21,198,400 kWh	
Red Hook WWTP	63 Flushing Ave. Brooklyn, NY 11205	643,168 sq-ft	1,938 kW	3,108 kW	17,367,628 kWh	
Fallman Island WWTP	127-01 Powells Cove Blvd. College Point, NY 11356	1,295,433 sq-ft	3,358 kW	5,228 kW	29,710,929 kWh	
Wards Island WWTP	Wards Island New York, NY 10035	3,023,582 sq-ft	11,308 kW	14,723 kW	99,489,600 kWh	
PSEG-LIPA Territory						
Rockaway WWTP	106-21 Beach Channel Dr. Rockaway, NY 11694	549,418 sq-ft	1,580 kW	1,784 kW	11,849,112 kWh	0.12954 \$/kWh
	TOTAL	19,144,105 sq-ft	66,380 kW	90,135 kW	587,596,626 kWh	
	AVERAGE	1,472,623 sq-ft	5,106 kW	6,933 kW	45,199,740 kWh	

Appendix C: Example Solar PV Installations

The City is seeking high-level assessments or descriptions of potential PV systems at the specified WWTPs with PV racking/canopies built on rooftops, unused vacant land, parking lots, and/or space over process treatment tanks and/or other plant equipment through use of platforms/canopies or other structures to support a PV array. All methods must ensure that their placement and operations do not disrupt the safety, operations, and maintenance of the WWTP, and must take into account impacts on the local community. Various examples of existing PV systems built at wastewater treatment facilities utilizing these methods may be referenced to assess their replicability at City owned WWTPs. Examples of similar projects that respondents may refer to include, but are not limited to, the below. Please note that the City does not endorse any specific project, vendor, system, or method in issuing this RFI.

- Camden Solar Center: http://www.ccmua.org/?page_id=1818
- Northwest Bergen County Utilities Authority: http://nbcua.com/Sections-read-14.html
- West Basin Municipal Water District: http://us.sunpower.com/commercial-solar/case-studies/west-basin-municipal-water-district/
- Morristown Wastewater Treatment Plant: http://www.vanguardenergypartners.com/projects/government/wastewater-treatment-pl ant.html

