

The New York City Department of Environmental Protection and the Department of Citywide Administrative Services Energy Independence and Sustainability Initiative

Lloyd Williams

URBST 372

Professor Melissa Checker



A decorative film strip with various nature scenes, including a butterfly, a red barn, green leaves with red berries, yellow flowers, and a small white house, runs diagonally across the top and bottom of the slide.

Steps Taken to Achieve an Environmentally Sustainable Energy Independent New York City

- Local Law No:24 of the City of New York for the Year 2016.
- Guidelines for the Design Of Solar Ready Rooftops.
- Research Tools used for Solar Ready Roofs.
- Solar Storage Solutions.



Local Law No:24 of the City of New York for the Year 2016

- Photovoltaic systems for city-owned buildings
- The cumulative savings expected to result from such installation, including expected savings in energy costs, will in 25 years or less, equal or exceed the expected costs of such installation.
- “eligible roof” means a city building roof that is less than or equal to ten years old and in good condition, as defined by city asset management standards.



Guidelines for the Design Of Solar Ready Rooftops

- Local Law 24 of 2016 (LL24) codifies a standard benchmarking expectation for Mayor de Blasio's One City: Built to Last solar initiative of installing 100MW on city buildings, aiding the plan's overarching 80% reduction in GHG emissions by 2050.
- LL24 was signed in March of 2016 and takes effect immediately. At this time, LL24 does not require that city buildings are built to solar-ready standards; rather it lays the framework by which the best opportunities for large scale solar can be identified.
- The law in its current form requires DCAS to evaluate City-owned buildings 10,000 gross square feet or greater for solar photovoltaic (PV) potential.
- In order for DEP to assist DCAS with reporting requirements for the Mayor's current initiatives, current and future projects must be designed with "solar-ready" roofs. Solar-ready roofs, in general, are defined as having a certain area of unshaded or unobstructed rooftop that is clear of other roof items, and that have the structural capacity for an additional 6 pounds per square foot.

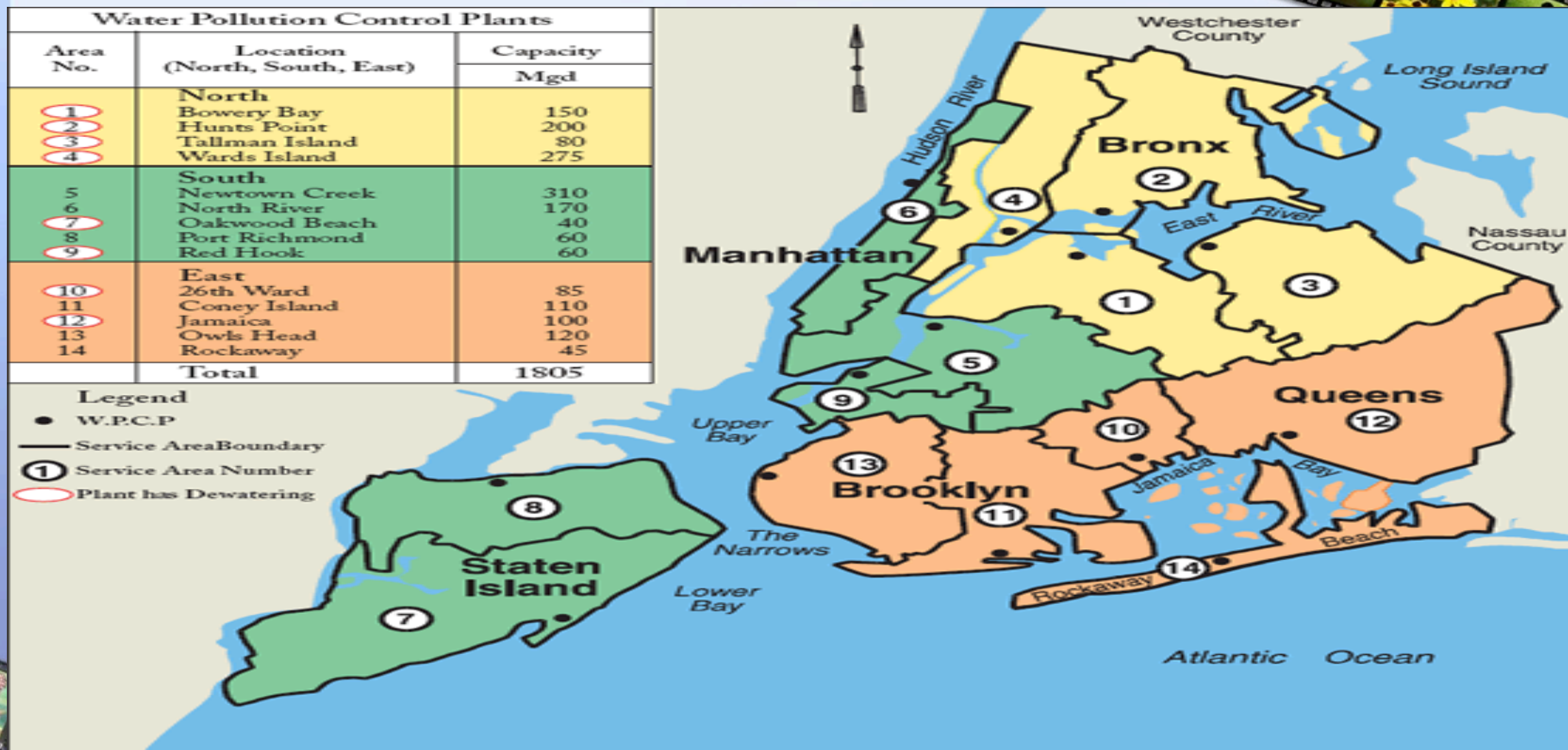


City-owned Buildings

- Some of the city owned buildings looked at are New York City Department of Environmental Protection's Wastewater Treatment Plant.
- There are 14 WWTP in the five boroughs, 26th Ward (Eastern Brooklyn), Bowery Bay (Northeast Queens), Coney Island (South & Central Brooklyn), Hunts Point (Eastern Bronx), Jamaica (Southern Queens), Newtown Creek (Manhattan, Brooklyn, Queens), North River (Manhattan), Oakwood Beach (Staten Island), Rockaway (Queens), Owls Head (Brooklyn), Wards Island (Bronx & Manhattan), Tallman Island (Queens), Port Richmond (Staten Island), Red Hook (Brooklyn & Governor's Island)..
- Out of the 14 only 13 are eligible for consideration for "Solar Roofs" campuses (One WWTP is underground).

Water Pollution Control Plants		
Area No.	Location (North, South, East)	Capacity
		Mgd
1	North Bowery Bay Hunts Point Tallman Island Wards Island	150
2		200
3		80
4		275
5	South Newtown Creek North River Oakwood Beach Port Richmond Red Hook	310
6		170
7		40
8		60
9		60
10	East 26th Ward Coney Island Jamaica Owls Head Rockaway	85
11		110
12		100
13		120
14		45
	Total	1805

- Legend**
- W.P.C.P
 - Service Area Boundary
 - ① Service Area Number
 - Plant has Dewatering





Tools used in Research for Solar Ready Roofs

- New York City's Wastewater Treatment System (<http://www.nyc.gov/html/dep/html/wastewater/wwsystem-plants.shtml>)
- NYC OASIS map (<http://www.oasisnyc.net>)
- NY Solar map (<https://www.nysolarmap.com>)
- Google Map (<https://www.google.com/earth>)

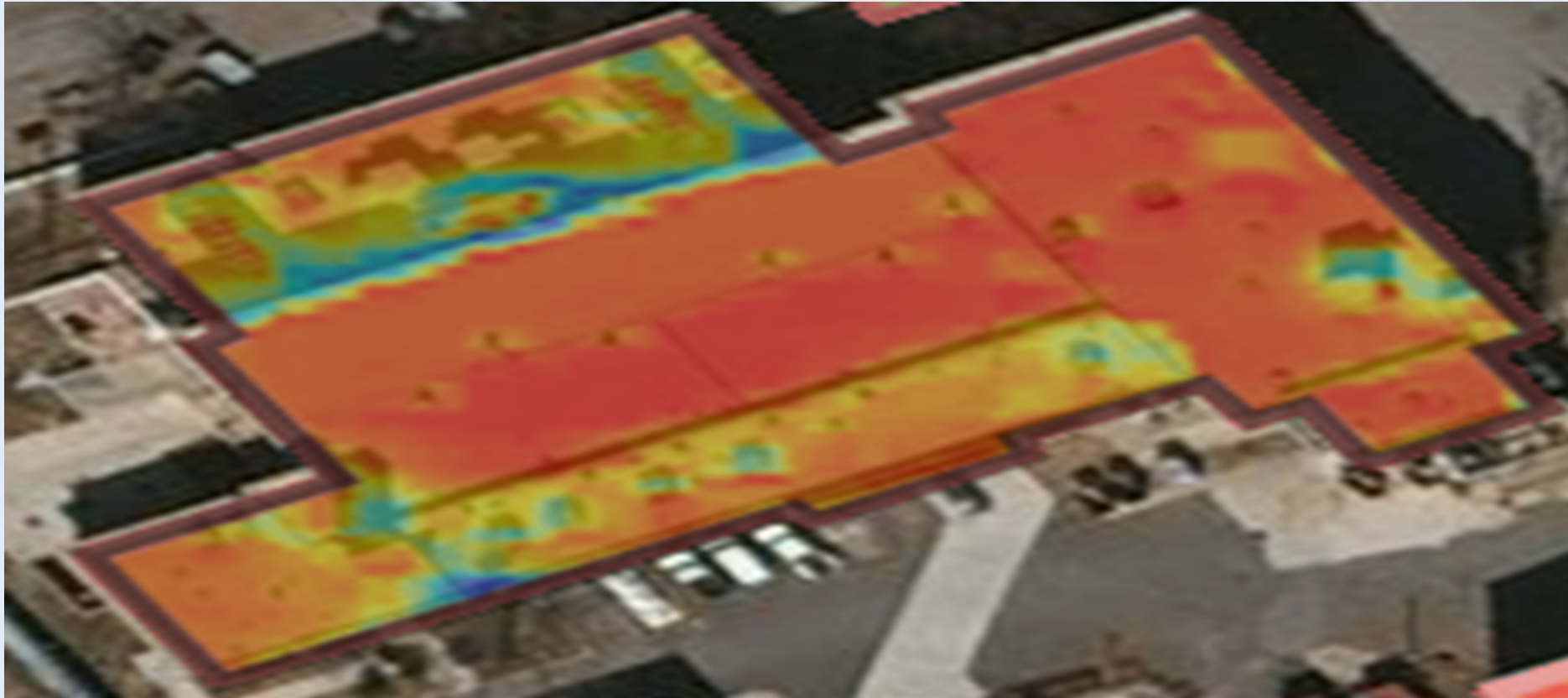
NYC Oasis 2D Map of 26th Ward WWTP Campus



Google Earth 3D Map of 26th Ward WWTP



NY Solar 2D Map of 26th WWTP



Solar Potential Calculator

1. Solar System Assumptions

Building / User Type <i>i</i>	Tax Exempt ▼
Approx. Monthly Electric Bill <i>i</i>	\$24,100.00 ▲ ▼
Financing Type <i>i</i>	Cash ▼

RESET

* financing options can change your required upfront cost (see below) to adjust payment type.

2. Output

12266 FLATLANDS AVENUE, Brooklyn

Optimal System Size (kW DC) 245.18

(24,518 square feet out of 24,518 usable square feet)

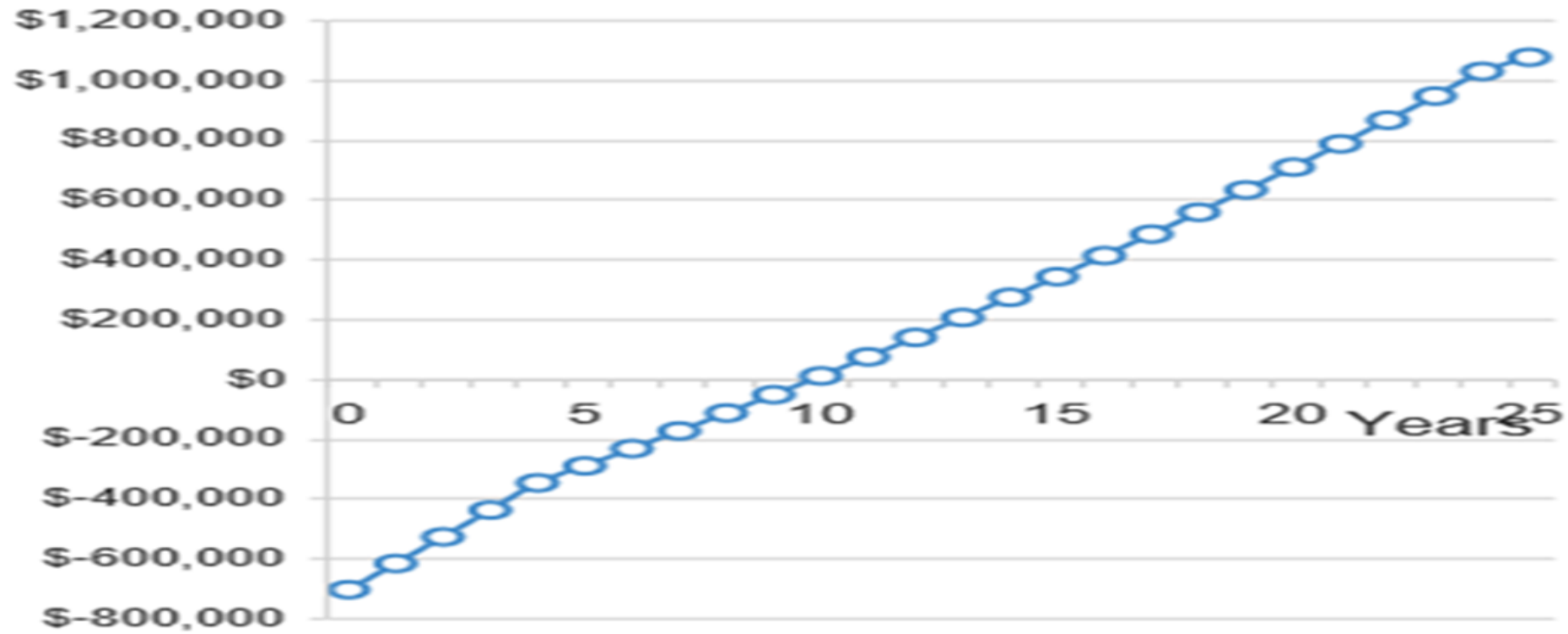
Payback Period 10 years

Annual Savings \$67,028

Out-of-Pocket Cost \$706,151

Net Cost After Incentives & Taxes \$564,921

Cumulative Net Cash Flow





Positive Results from Research of Solar Ready Roofs

- On average every WWTP has 1-7 eligible roof tops that meet the standards stated in local law 24
- Every roof top is 10,000 sq. ft. or more of space
- Each roof can produce 100KW or more of solar energy
- Each Roof double the cost investment of installing solar panels
- NYC Owns and control all of the assets being assessed

Example of a Solar Ready Roof at Port Richmond (Staten Island)



Solar Storage Solution “The Battery Locker”





Challenges from Research of Solar Ready Roofs

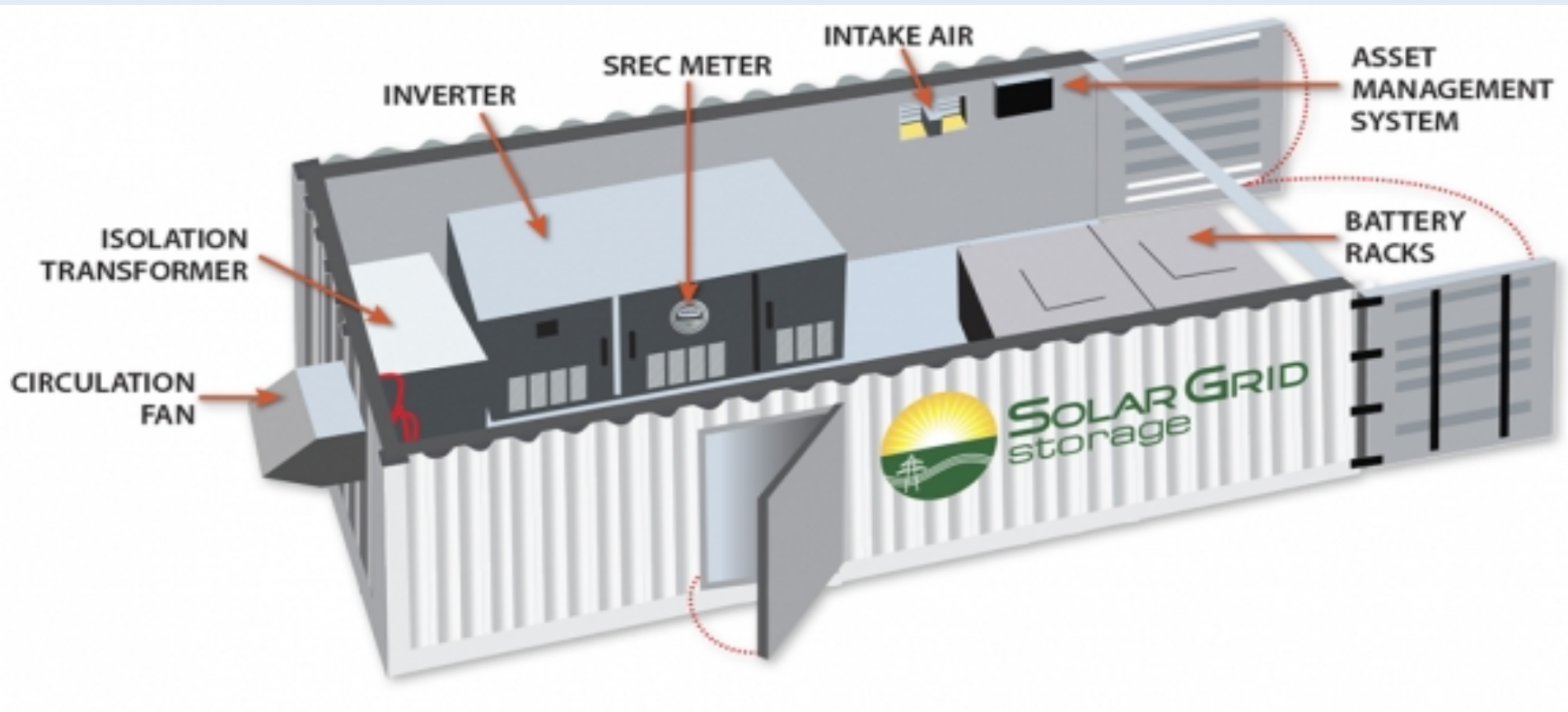
- There are no online NYC government agency tools that gives updated real time data on city owned assets to tell the age of the roofs.
- Many of the waste water treatment plants Roofs have not been upgraded and if they were the information is not readily accessible only to the seven (7) Facilities managers or 14 Plant Chiefs.
- Most buildings with potential Roofs at the waste water campus are not systematically numbered for easy recognition.
- No space inside the facilities for storage solar batteries.



NYC Department of Environmental Protection Battery Locker

- Is a self contained, weather proof, fire and explosive proof mobile structure that can be set up outside of any facility, away from the buildings and workers.
- The unit can be placed on a cement platform and raised by jacking pads or a fork lift as needed to make it climate change resilient(sea-level rise, extreme weather flooding).
- The batteries can be lead acid or Lithium-Ion, the storage can also be used as a hazardous material locker.

NYC Department of Environmental Protection Battery Locker

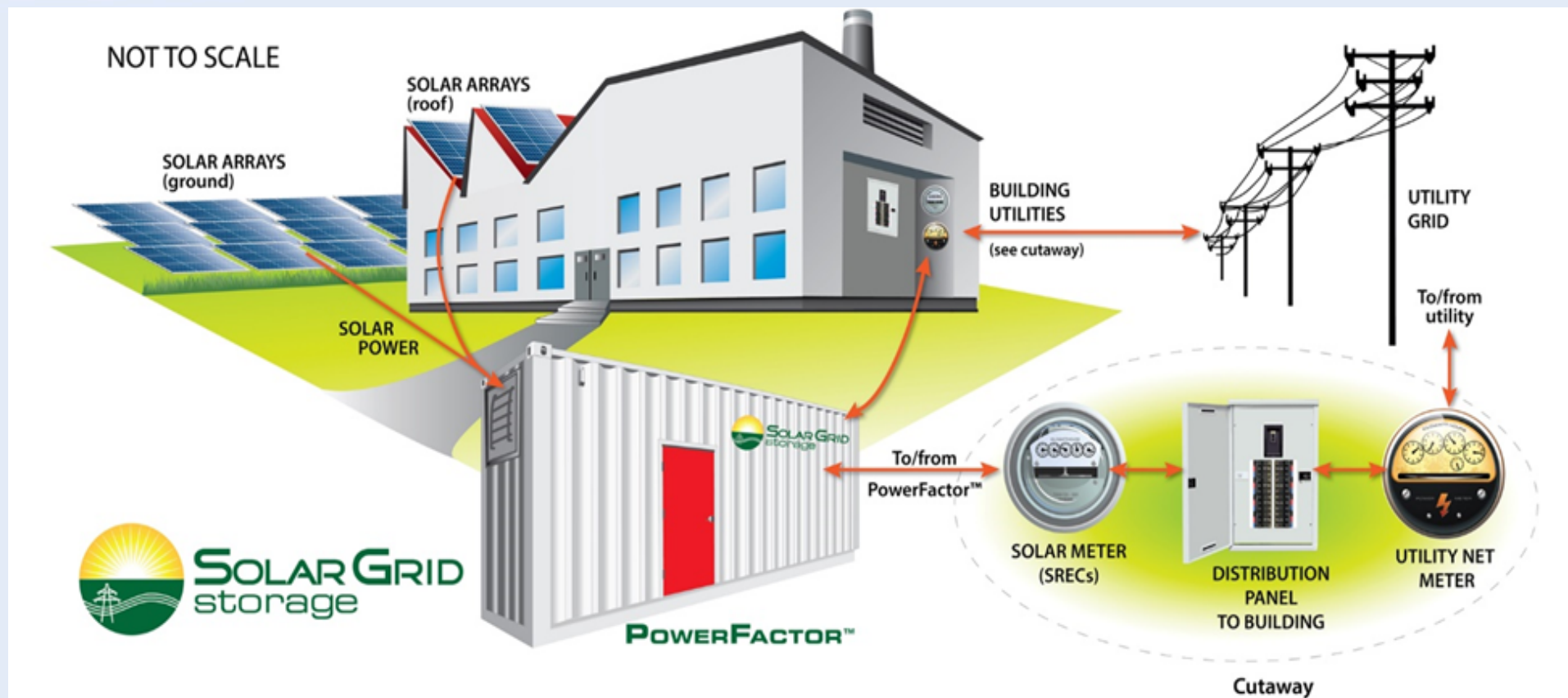


NYC DEP 'Energy Buffer Unit' (EBU)



- The Energy Buffer Unit is one of the most recent innovations on the energy market. Boasting an output of 750 kilowatts (VAC) for 40 minutes for each battery container, the energy storage system can help stabilize national energy grids and guarantee reliable energy supply during the energy turnaround.
- Independent of location and scalable thanks to sophisticated container design
- Low maintenance and long service life through automated battery management and remote monitoring
- Cost-efficient due to the use of high-performance lead acid batteries

N.Y.C D.E.P Energy Independent WWTP of the Future





References

- NYC DEP& NYC DCAS “Guidelines for the Design Of Solar Ready Rooftops” April 2017
- New York City's Wastewater Treatment System (<http://www.nyc.gov/html/dep/html/wastewater/wwsystem-plants.shtml>)
- NYC OASIS map (<http://www.oasisnyc.net>)
- NY Solar map (<https://www.nysolarmap.com>)
- Google Map (<https://www.google.com/earth>)
- <http://www.belectric.com/en/energy-storage/>
- <http://solargridstorage.com/news/view/gridstar-dedication-cloudy-with-100-chance-of-storage>

THANK YOU FOR COMING!!!

