CUNY 2024 Solar + Storage Installer Workshop

3/20/2024

conEdison

Opening Remarks

Raghu Sudhakara
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CUNY Workshop 2023 Agenda

Presenter	Topic
Joana Abreu	**Demand Response Program Overview**
Marissa Castoro	**Non-Wires Solutions Overview**
Andre Douglas	**Con Edison Cleaning NYC's Air through Electric Vehicle Adoption**
Karice Redhead	**Low-Income DER Make Ready Program**
Brian Schaitkin	**Con Edison Energy Storage Programs Overview**
Will Taylor & Wassim Salloum	**Enabling FERC 2222**
Libin Mao	**Best Practices - Interconnecting Energy Storage**
Kathryn Osenni	**Electrification Capacity Map**

Smart Usage Rewards
ConEd's Demand Response Programs

CUNY Solar and Storage Workshop 2024

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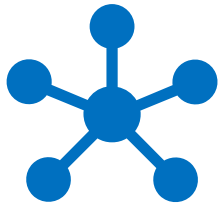
Agenda



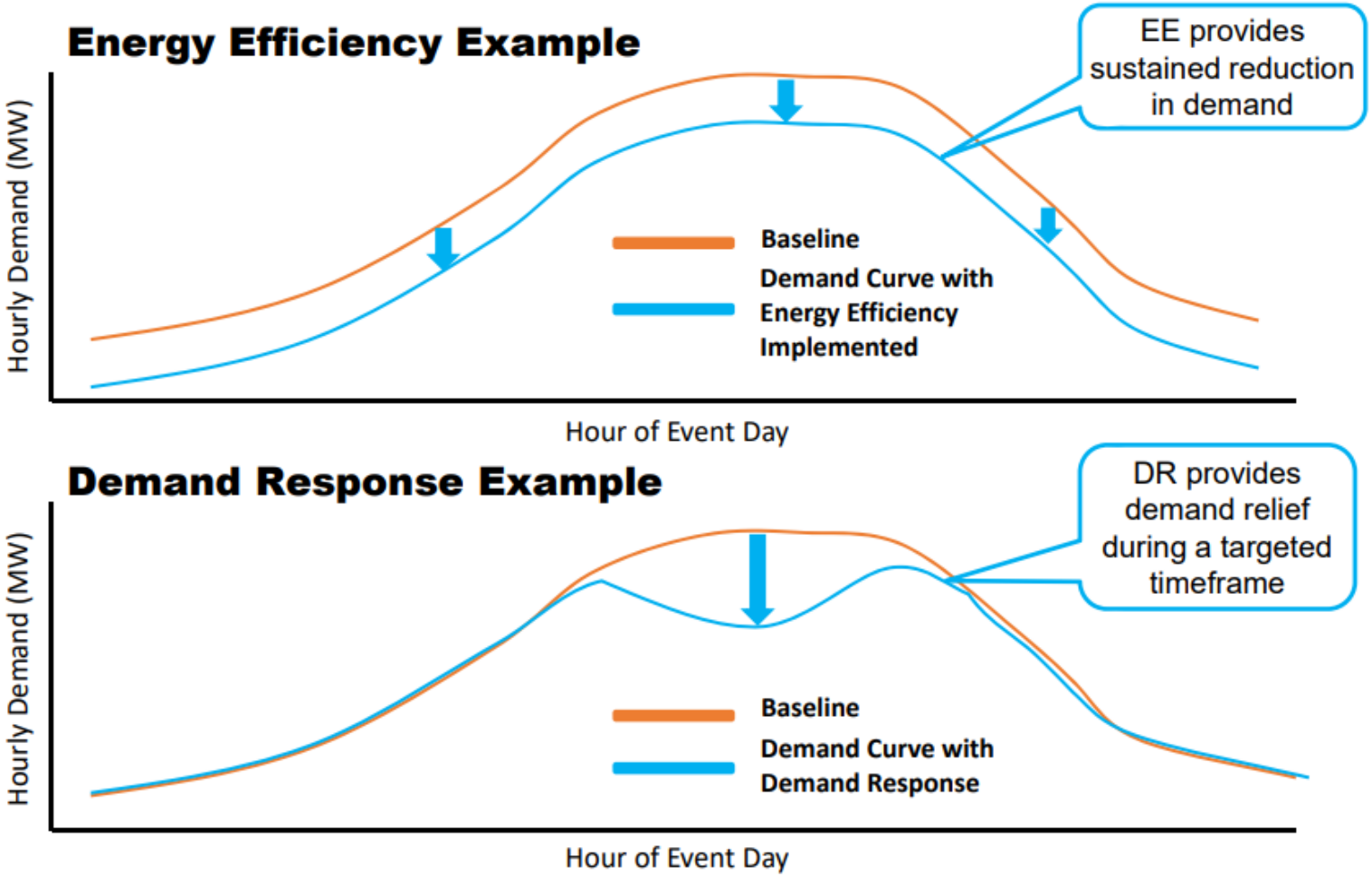
Opportunity

Innovation

Smart Usage Rewards

DR Opportunity

Demand Response Opportunity

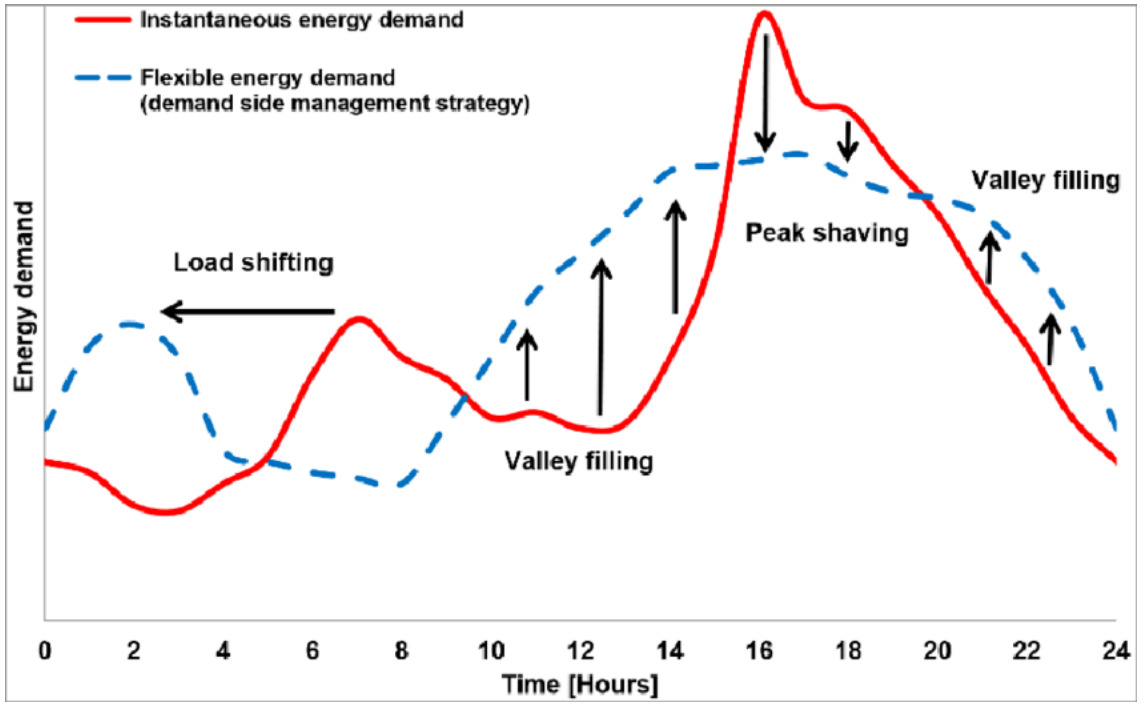


Demand Response Strategy Adequacy

Demand response strategies

- Automation
- Onsite backup generation
- Shift time and duration of internal processes
- Pre-cool or pre-heat
- Prioritize scheduled activities
- Adjust HVAC settings, dim lights, adjust speed of fans

Shifting, shaping or shimming



Wholesale vs. Distribution DR Programs

Wholesale Programs

- Resource adequacy
- Reliability

Distribution DR Programs

- Distribution Load Relief Program
  - Increase electric service reliability
- Commercial System Relief Program
  - Peak shaving

Innovation

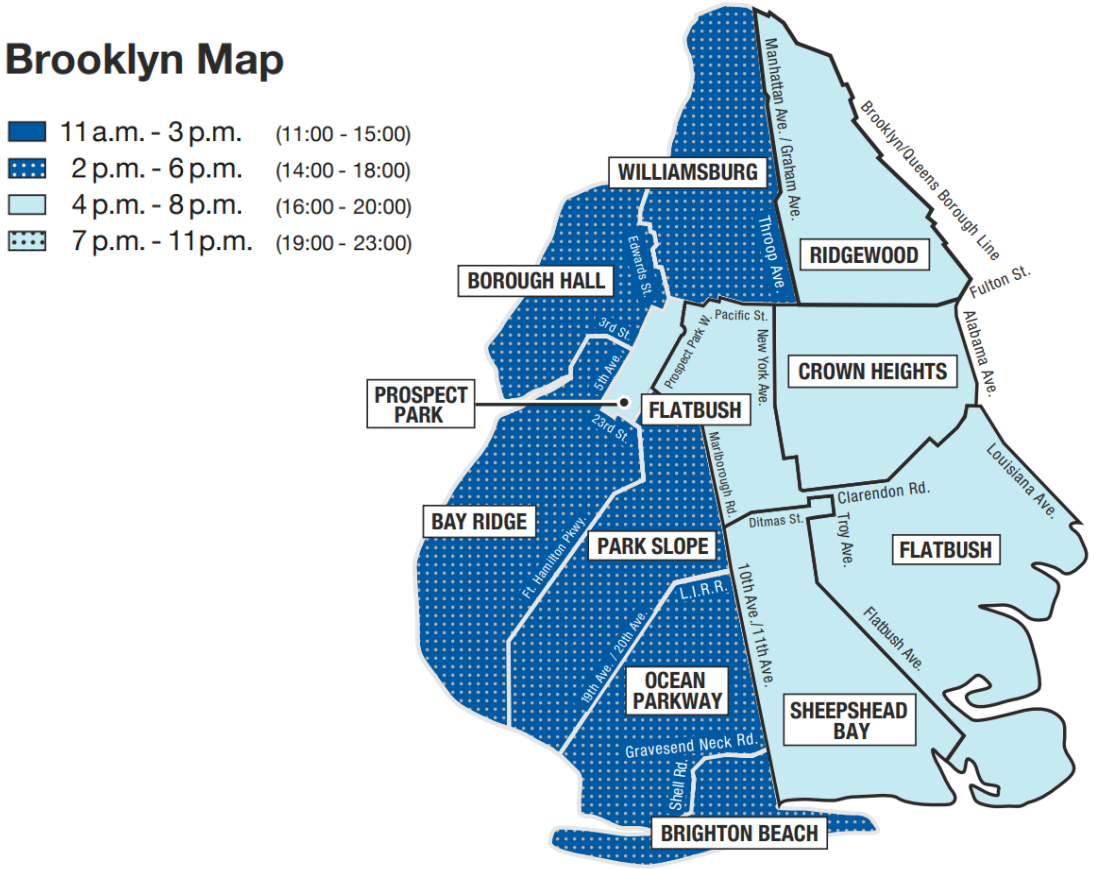
Network Peak Window Map

What is a Network Peak Window?

Window of time when energy usage is the highest in a designated area

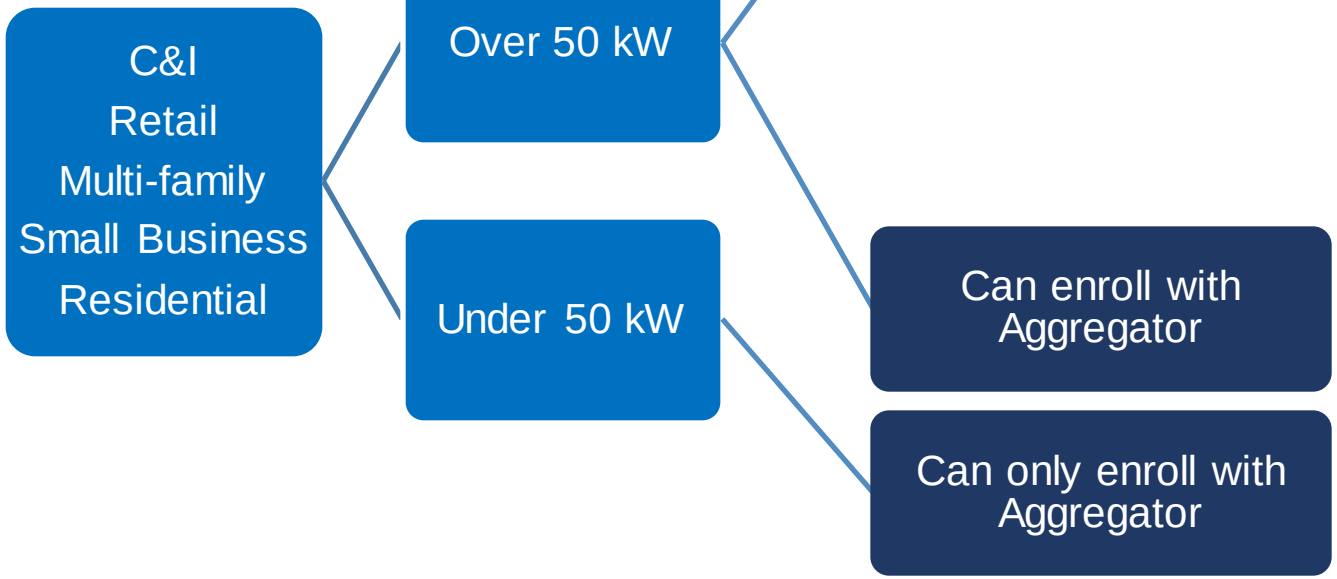
How is Network Peak different than ConEd System Peak?

System peak is the window of time where the most energy is used across the entire Con Edison service territory whereas network peak is the window of time when energy usage is the highest in a specified geographic area.



Technology and Capacity Agnostic

Democratizing the Demand Response Opportunity



Enrolling Directly with Con Edison

- Receive full DR incentives
- Better for customers more experienced with DR

Enrolling with an Aggregator

- Can help customers develop tailored DR strategies
- Often bundle DR with other energy services
- Can enroll customers in NYISO DR programs
- Takes cut of DR incentives

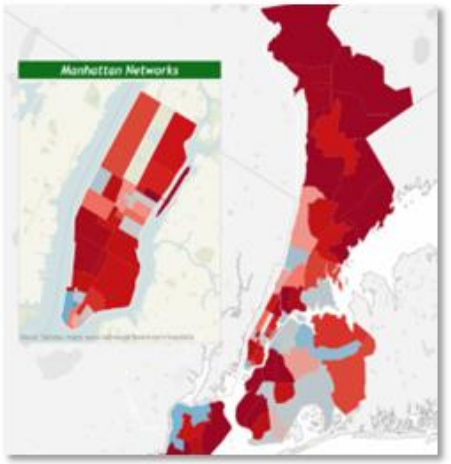

Smart Usage Rewards

Con Edison DR Offering

Customers provide load relief by curtailment or generation pledge

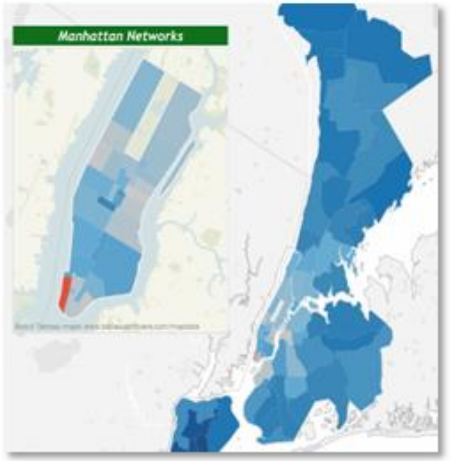
System-Wide Peak Shaving (CSRP, Term-DLM)

- Day-ahead notification based on system load forecast
- Each network has 4-hour call window aligned with network peak



Network-Specific Reliability (DLRP, Auto-DLM)

- 2-hour or less notification based on network contingency
- Events are 4-6 hours long



Customers may also provide load relief through BYOT programs

Rider T Program Offerings
System Relief Program (CSRP)

Availability

- Weekdays Only (May – September)
- 4 Yearly Fixed Call Windows
  - 1100 – 1500
  - 1400 – 1800
  - 1600 – 2000
  - 1900 – 2300
- **NEW**: 6-hour call window for 18 networks
- Window varies by network location

2024 Trigger

- 92%: 11,600 MW and 88% 11,300 MW

Rider T Program Offerings
Distribution Load Relief Program (DLRP)

Activation Conditions

- Next Contingency and Condition Yellow
- Active Voltage Reduction
- **Co-enrollment with CSRP**

Availability

- 0600 – 2400 (May through September Only)
- Events can extend beyond 2400 on a voluntary basis
- 7 days a week

Call Options

- > 2 Hours Ahead – Contingency Event
- < 2 Hours Ahead – Immediate Event

Rider AC Program Offerings
Dynamic Load Management (DLM)

Term- and **Auto-DLM**

- 3 – 5 Year Long term Contracts
- RFPs submitted and approved on a network basis
- Customers will only be enrolled in RFP-approved networks

Term-DLM can be called simultaneously with CSRP

- 4-hour call windows 5-days per week
- Load forecast trigger offers **option to call at 88 percent of peak (11,300 MW)** and **obligation at 92 percent (11,600 MW)**
- Customers can be co-enrolled in DLRP

Auto-DLM can be called simultaneously with DLRP

- Contingency calls with as little as ten minutes notice, 7-days per week
- Also called for Term-DLM events
- No options for co-enrollment

Rider L Program Offering
Bring Your Own Thermostat (BYOT)

- Residential Program
  - Direct Load Control
  - Must have Central HVAC system
  - Smart Thermostats
    - Nest
    - Honeywell
    - Emerson
    - Amazon
  - Called in conjunction with CSRP or DLRP
  - Can not co-enroll in Rider T or AC
  - In 2023 BYOT provided **35 MW** of load relief

Impact

65K
Total Enrollments

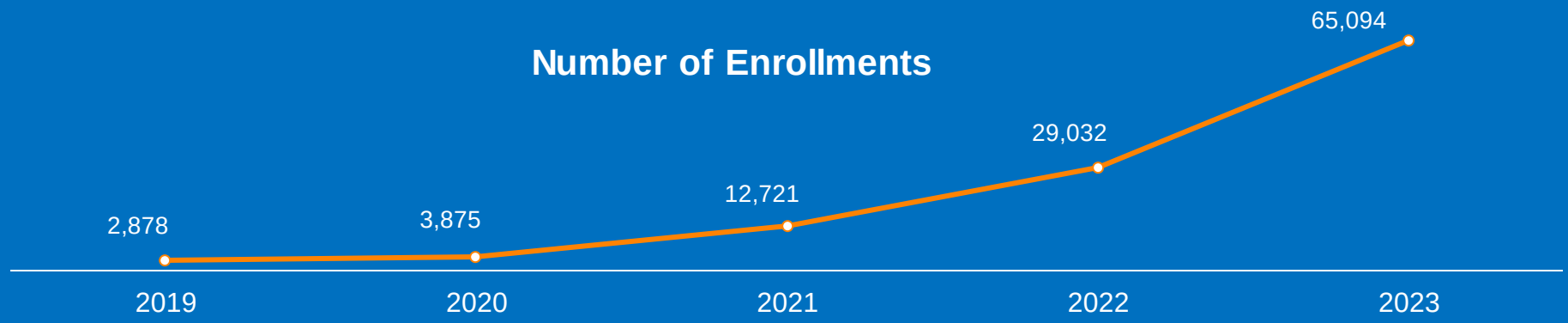
928
Total MW Pledged

▲ **2.2x**
Total Enrollments 2023

27
6 Peak Shaving
21 Network Reliability
Total Events Called

63%
Average event performance

▲ **1.2x**
Total MW Pledged 2023



Thank You

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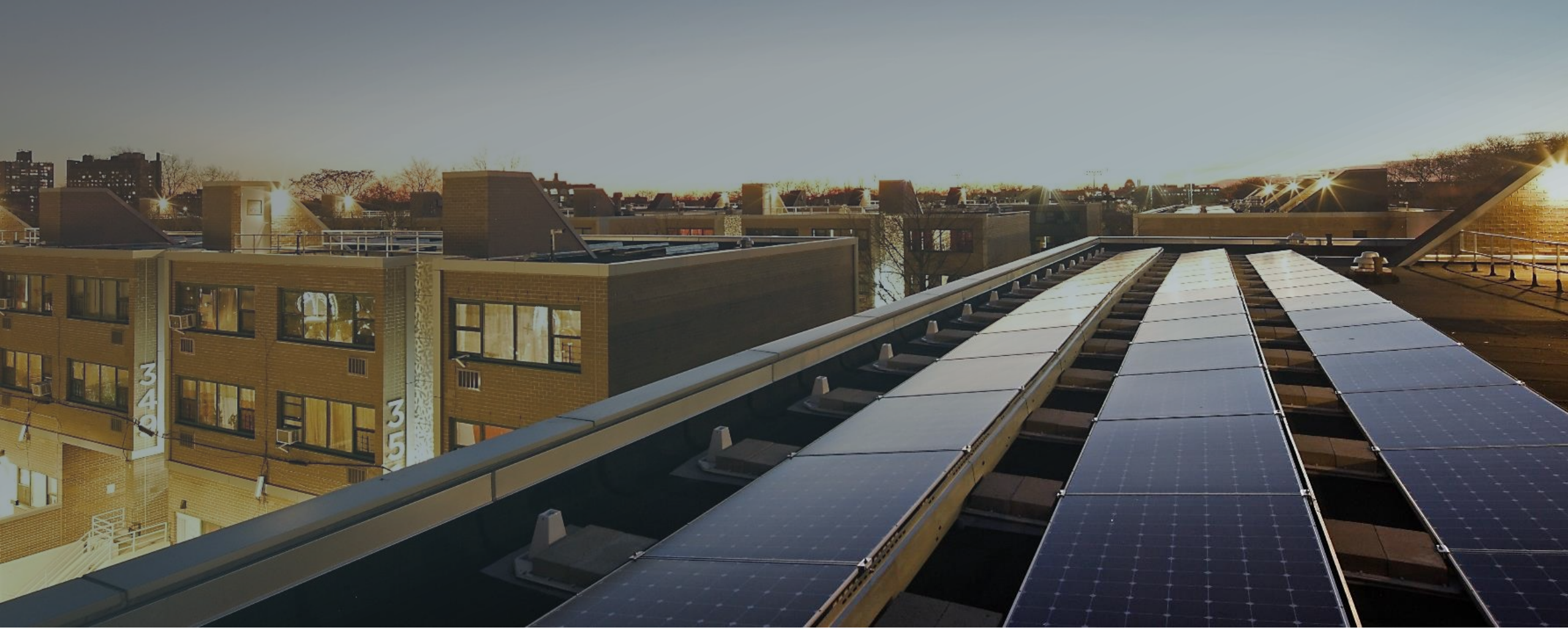

Non-Wires Solutions Overview

March 20, 2024

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Introduction

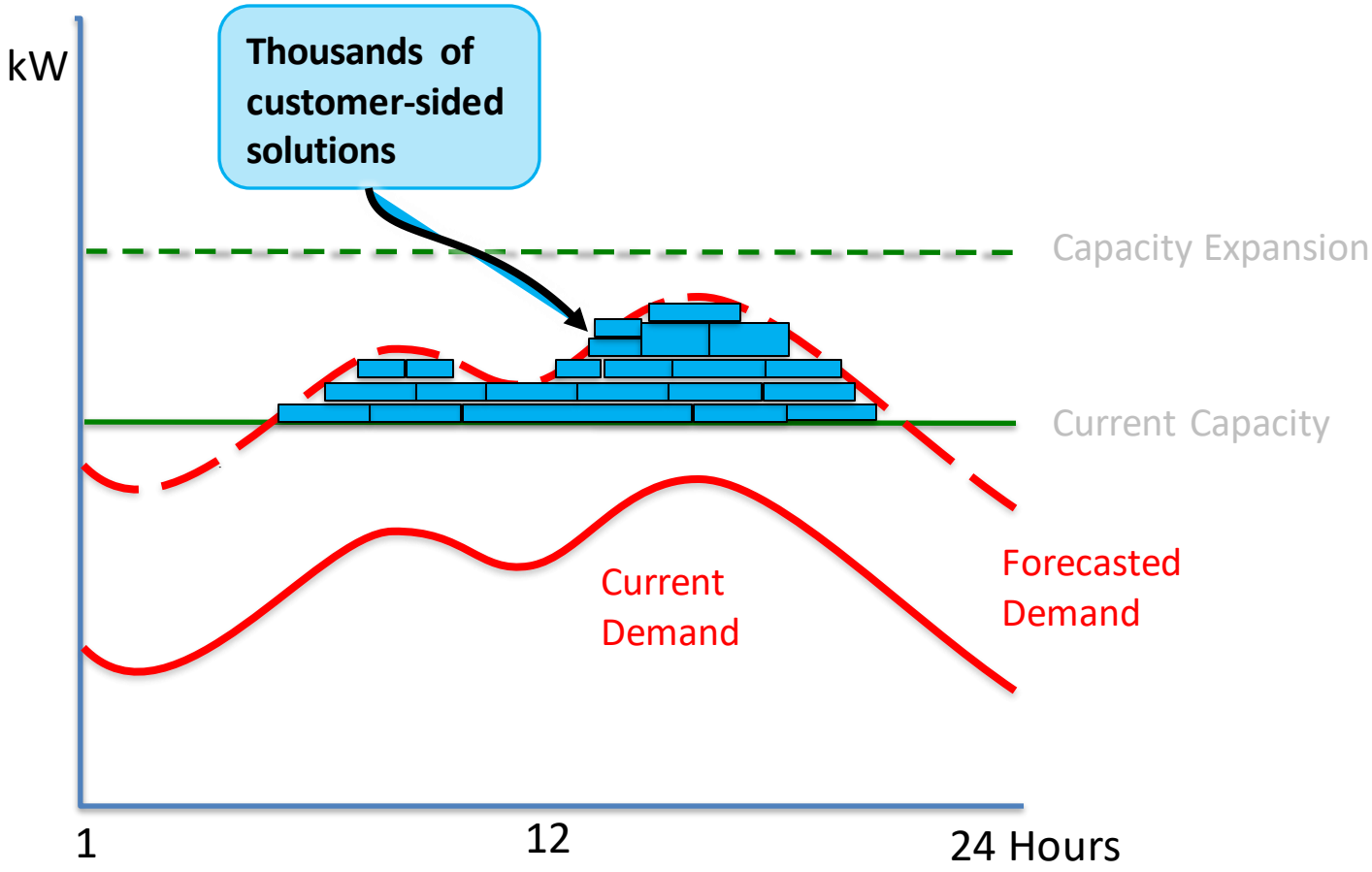
Marissa Castoro
Non-Wires Solutions

Agenda

- Non-Wires Solutions Overview
- Portfolios and Program Structure
- Future NWS Opportunities

Non-Wires Solution (NWS) Overview

An NWS Project is a portfolio of non-traditional solutions that seek to defer or eliminate traditional infrastructure projects for the benefit of the distribution system



NWS provides benefits by:

- Working with customers to implement cost effective solutions that benefit communities
- Implementing portfolios that provide a net benefit to society
- Incentivizing innovative technologies
- Accelerating adoption of EE technologies

Summary of NWS Portfolios

Brooklyn Queens Demand Management (BQDM) Program

- Designed to defer new Gateway Substation
- Launched in 2014 and extended in 2017
- Released Prescriptive ESS program in 2022

Newtown

- Designed to defer load transfer from Newtown to North Queens
- Released RFP in 2019 for deferral from 2021 to 2025

Jamaica

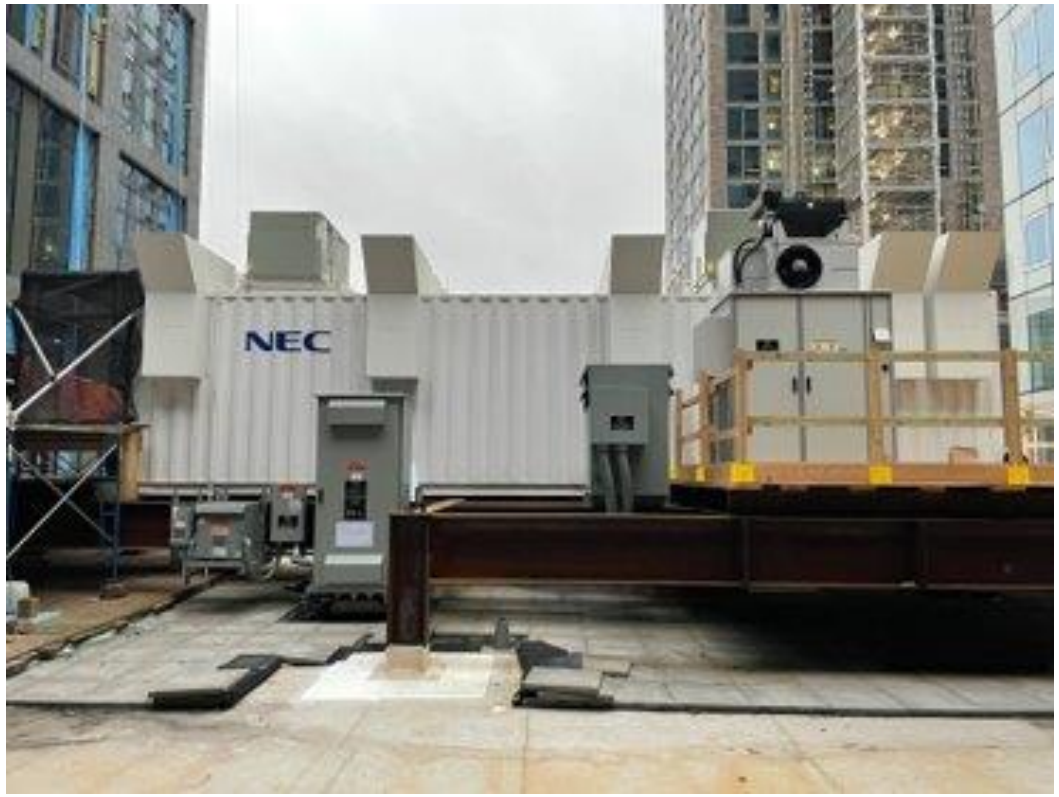
- Designed to eliminate equipment upgrades at Jamaica Substation
- Released RFP in 2023 to seek load relief through 2027

Water Street (Closed)

- Successfully eliminated equipment upgrades at Water Street, Plymouth Street, and Farragut Supply Stations
- Commenced in 2018 for reductions needed for 2019 through 2021

Case Study - Barclays Center Energy Storage System (500kW)

- Part of Water Street NWS Portfolio
- Behind-the-Meter battery operated by Enel X
- 50% installation incentive upon commercial operation date, 50% annual performance incentive
- Installed in 2021, performance contracted through summer of 2030
- Contracted for summer dispatch to provide 500 kW load reduction (total capacity is 750 kW)
- Multiple value streams for customer



Barclays Center NWS Battery Energy Storage System

General Program Structure and Requirements

Applicant commits to:

- Limit projects to 5 MW of load reduction
- Follow NYS Standardized Interconnection Requirements (SIR)
- Use BESS technology approved for use in NYC
- Choose service connection that meets local reliability standard (e.g. N-2)
- Provide first-right-of-dispatch during the Summer Performance Period (May 1st – September 30th)
- Min. of 4 consecutive hours guaranteed load reduction
- Not participate in competing programs/markets
- Comply with Measurement & Verification plan

Con Edison commits to:

- Pay 50% of incentive upon approved operationality
- Pay up to 50% over 10-year contract term based on performance
- Provide 21-hour notification of NWS Events

Battery Energy Storage System in Woodside, Queens

Future NWS Opportunities

- For the latest program info check out:
  - **NWS RFP page,** view past opportunities
  - **Brooklyn/Queens Energy Storage Incentive**
- To make sure you don't miss announcements please reach out to us to be added to our distribution list at DSM@coned.com
- Interested developers, **email us** to set up an introduction meeting

- What do we look for in strong proposals?
  - Permitting and interconnection considerations
  - Detailed project timeline
  - Detailed evaluation of project risks
  - Clear scope of work description

Brooklyn-Queens Energy Storage Incentive (BQDM)

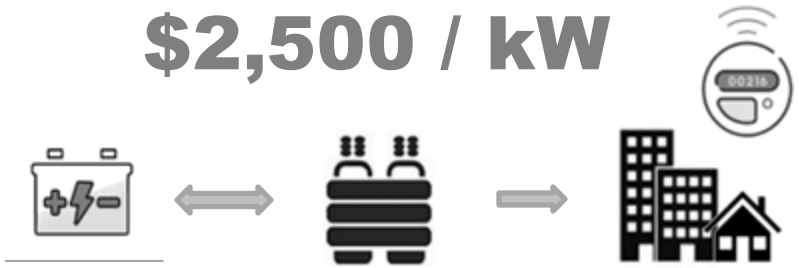
Program Cap Achieved

Open through April 30, 2024

Grid Connected

(Front-of-meter; requires distribution circuit level upgrades)

$2,500 / kW

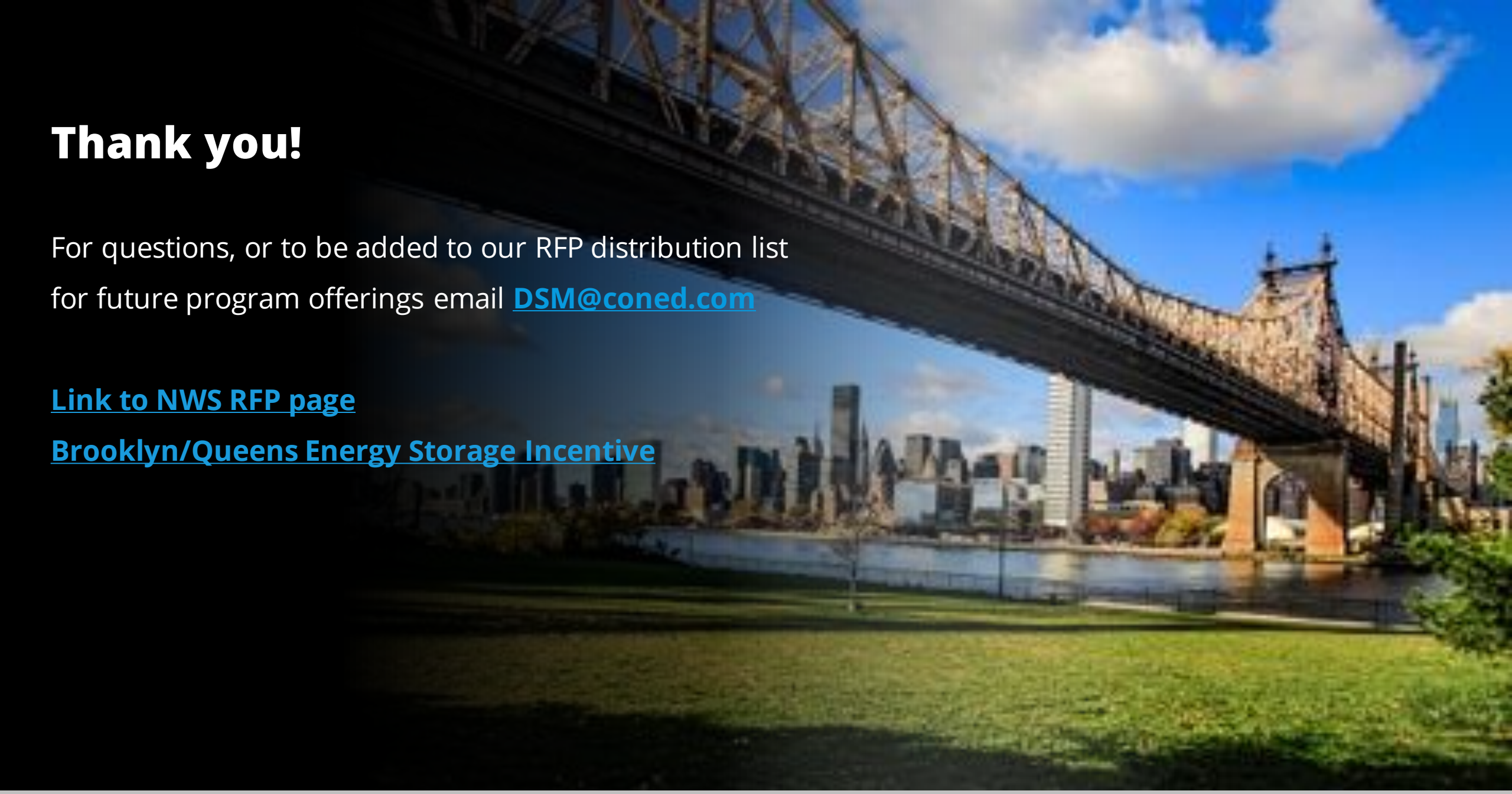


Load Following

(Behind-the-meter; does not require distribution circuit level upgrades)

$3,000 / kW

- First operational summer begins May 1, 2025, projects not operational by May 1, 2026 will not be eligible for incentives
- Projects operational on or before May 1, 2025 eligible for 10% bonus on operational payment
- Remaining 50% performance payments paid over 10 summer terms based on system performance
- **To apply:**
  - Complete interconnection application through Power Clerk web portal
  - Pay 25% of interconnection costs per completed CESIR study
  - Submit NWS Application, available on our website, to DSM@coned.com



Thank you!

For questions, or to be added to our RFP distribution list for future program offerings email DSM@coned.com

Link to NWS RFP page

Brooklyn/Queens Energy Storage Incentive

Con Edison Cleaning NYC's Air through Electric Vehicle Adoption

CUNY Summit

March 20th, 2024

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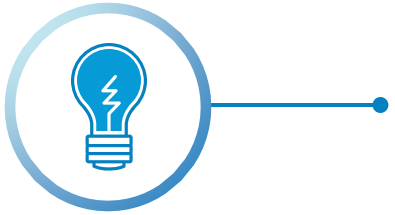
Con Edison Clean Energy Commitment

Sustainable Energy for Generations to Come

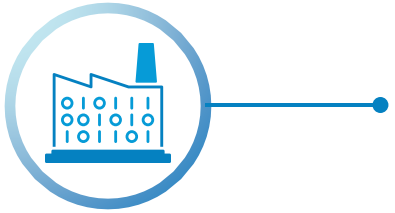
Build the Grid of the Future

Build a resilient, 22nd century electric grid that delivers 100% clean energy by 2040.



Empower our customers to meet their climate goals

Accelerate energy efficiency with deep retrofits, aim to electrify most building heating systems by 2050, and all-in on electric vehicles.



Reimagine the gas system

Decarbonize and reduce the utilization of fossil natural gas, and explore new ways to use our existing, resilient gas infrastructure to serve our customers' future needs.

Lead by reducing our company's carbon footprint

Aim for net-zero emissions (Scope 1) by 2040, focusing on decarbonizing our steam system and other company operations.

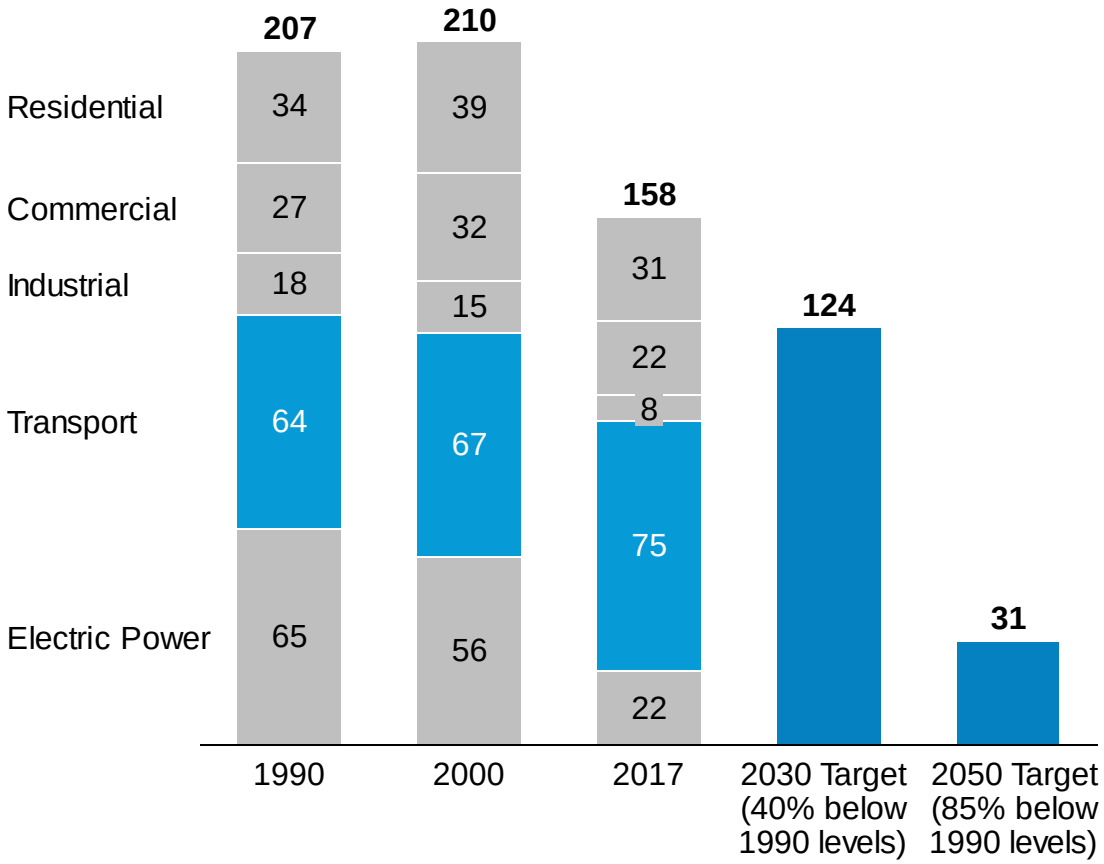
Partner with our stakeholders

Enhance our collaboration with our customers and stakeholders to improve the quality of life of the neighborhoods we serve and live in, focusing on disadvantaged communities.

Con Edison is Enabling the EV Future

Transportation electrification is essential to reach ambitious New York clean energy goals

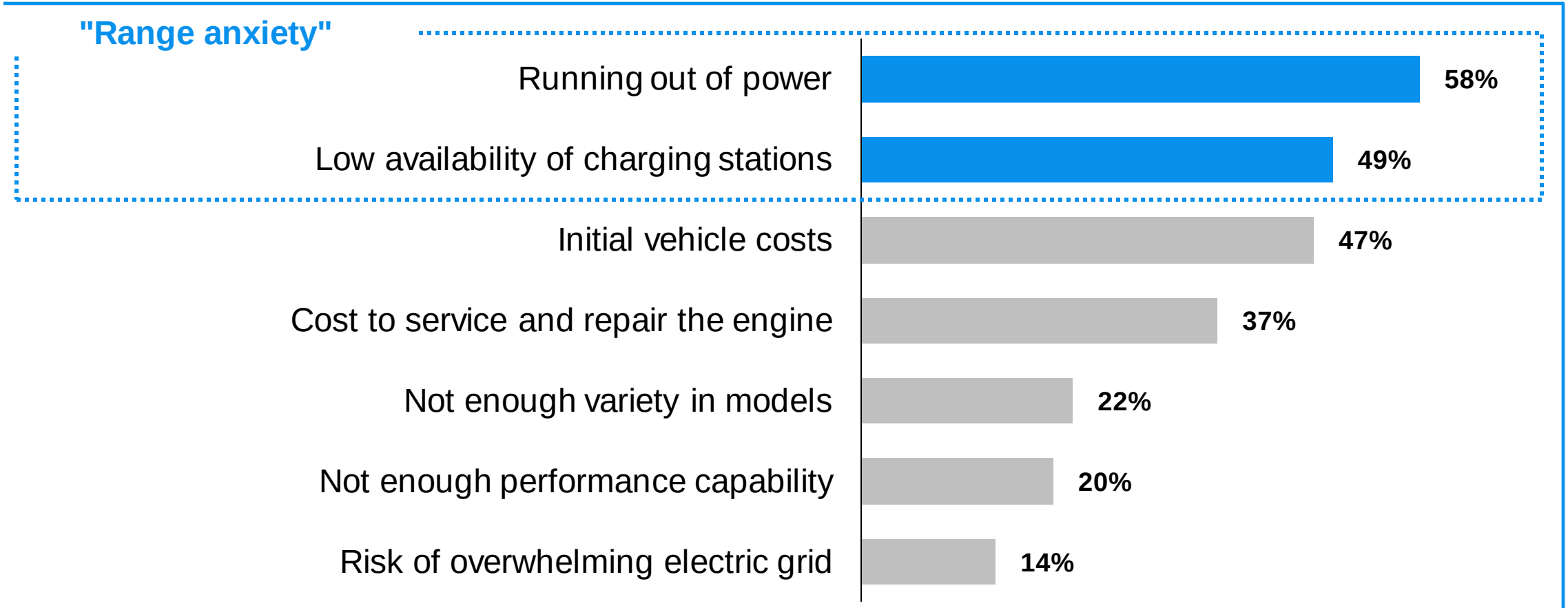
NY State carbon reduction goals [MMT of CO_2]



- **Transportation sector accounted for nearly 50% of all carbon emissions in NYS in 2017**
- **State climate goals can only be achieved through aggressive transportation electrification**

Increasing availability of EV charging is a vital solution to address barriers to EV adoption

% of drivers who consider factor to be a purchase barrier



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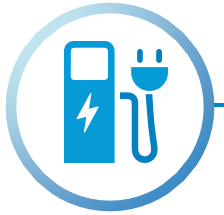
E-Mobility Programs & Initiatives Overview

Innovation



EV Infrastructure Incentives

Managed Charging Incentives

Customer Education and Support

Innovation

NYC Curbside EV Charging Demo

118 curbside charging plugs installed in NYC

66% System Utilization
99.9% System uptime
49,250 Charging Sessions

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flo EV Charging

School Bus Vehicle-to-Grid Demo

Electric school buses as a dual-use asset providing transportation and grid services

Testing technology solutions and impact on vehicle batteries

EV Infrastructure Incentives

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Light-Duty PowerReady Program

Program Overview

Program Description	Provides incentives to offset customer and utility-side infrastructure costs associated with installing light-duty EV chargers
Funding	$613M
Program Dates	**Start:** July 2020 **End:** December 2025
Program Goals	**L2 Plugs:** 21,371 **DCFC Plugs:** 3,157
Resources	Website Email

Incentive Overview

	Level 2 Plugs (< 50 kW)		DCFC Plugs (>= 50 kW)	
Access to Sites	**Non-Public**	**Public**	**Non-Public**	**Public**
Non-Proprietary Plugs	Up to 50% $5-7.5k per plug cap*	Up to 90%, $9-13.5k per plug cap*	Up to 50%, $400+ per kW cap*	Up to 90%, $720+ per kW cap*
Proprietary Plugs (ex. CHAdeMo, Tesla)	Up to 50%, $5-7.5k per plug cap*	Up to 50%, $5-7.5k per plug cap*	Up to 50%, $400+ per kW cap*	Up to 50%, $400+ per kW cap*

- Project caps can be increased based on specific criteria and characteristics
- Additional incentives are available to projects located within DACs (Disadvantaged Communities)

Eligibility and Requirements

Con Edison	Receive, or plan to receive, service from Con Edison
Plugs	**L2:** Minimum of 2 plugs **DCFC:** 6MW cap for 30+ plugs
Contractor	Customer-side work must be completed by approved contractor
Reporting	5-year reporting requirement pulled on a quarterly basis
Technical Standards	**Hardware:** ISO 15118 Part 2 and 20 + OCPP 2.0.1 by 11/16/24 **Software:** ISO 15118 Part 2 and 20 by 11/16/24

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Medium- and Heavy-Duty Vehicles Pilot

Program Overview

Program Description

Provides incentives to offset customer and utility-side infrastructure costs associated with installing medium-and heavy-duty EV chargers for qualifying commercial sites

Funding

$21M

Program Dates

Start: 2024

Resources

Website Email

Incentive Overview

		Non-Publicly Accessible	Publicly Accessible
Located within a Disadvantaged Community*	Yes	Up to 90% of utility-side costs Up to 50% of customer-side costs	Up to 90% of utility-side costs Up to 50% of customer-side costs
	No	Up to 90% of utility-side costs	

*Disadvantaged communities (DAC) are defined as communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high concentrations of low- and moderate-income households. See map to determine if your site is in a DAC zone.

Eligibility and Requirements

MHDV

For charging MHDV over 10,000 lbs gross vehicle weight

Chargers

L2, DCFC, or mixed

Non-Publicly Accessible Sites

Must be participating in one of the following voucher programs:

- NYSERDA Truck Voucher Incentive Program
- NYC DOT NYC Clean Trucks Program
- EPA Clean School Bus Program
- NYSERDA NY School Bus Incentive Program

Managed Charging Incentives

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SmartCharge Commercial

Program Overview

Program Description
The program offers a predictable cash incentive revenue stream for charging during off-peak periods and overnight

Funding
$227M

Program Dates
Start: January 2024

Resources
Website Email

Charging Incentive Overview

The more you shift to overnight and off network peak, the more you earn

			L2 Charger	DCFC Charger
Off Peak	Earn incentives **all days, year-round** for charging overnight		**$0.03** per kWh earned while charging from 12 AM – 8 AM	
Peak Avoidance	Earn incentives during **4-hour network peak** window with every kW avoided relative to nameplate capacity	Private	**$10** per kW avoided from Jun – Sep **$2** per kW avoided from Oct – May	
		Public	**$17** per kW avoided from Jun – Sep **$6** per kW avoided from Oct – May	**$20-26** per kW avoided from Jun - Sep **$8** per kW avoided from Oct – May

Requirements

Con Edison
Receive, or plan to receive, service from Con Edison

Charger Ownership
Show proof of ownership/ operating agreement of chargers or provide an application and data management authorization letter

Rate
Must be on commercial rate

Charger Data
Provide 15-minute interval data

Eligible Stations

- Public station
- Workplace
- Light-duty, medium-duty, heavy-duty fleets
- Multifamily housing
- Industrial locations

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SmartCharge New York

Program Overview

Program Description	The program offers cash incentives to EV drivers for charging their EVs at off-peak times, which reduces stress on the energy grid
Funding	$100M
Program Dates	**Start:** January 2023 **End:** December 2025
Resources	Website Email

Charging Incentive Overview

Off-Peak Charging Incentive (Year-round, baseline)	• **$0.10 per kW incentive for off-peak charging:** All days, year-round, between 12 - 8 AM
Summer Peak Avoidance Incentives (June – September)	• **$35 per month Avoided Summer Peak Incentive:** Earn per vehicle or charging station for avoiding charging weekdays 2-6PM (June – September) • **$35 Avoided Summer Peak Bonus Incentive:** Earn an additional $35 for avoiding peak charging during entire summer

Eligibility and Requirements

Con Edison	Charge in the Con Edison service area
Rate	Must be on standard rate (not Time-of-Use rate)
Connection	Must have compatible EV telematics or charger to participate
Charging Data	Must be able to provide location and energy use data
Eligible Models	Currently 60 models, 3 chargers. See FAQ for latest list

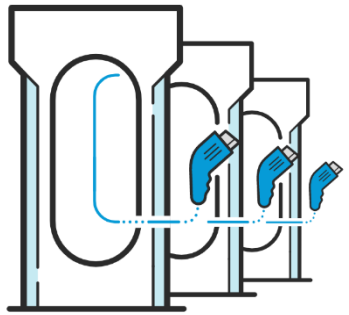
Customer Education & Support

Con Edison Advisory Services

Con Edison's EV Advisory Service helps you understand the grid capacity where you operate, how to plan for any upgrades, and what electric rates may be best for you. You should engage with advisory services if you are:

A Light, Medium, Heavy Duty Fleet Operator

A Developer unsure of where to site your next project



Interested in installing a charging hub

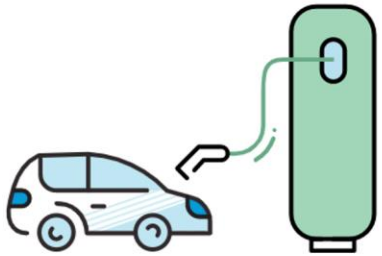
Unsure of where to start on your EV charging journey!

Program Resources

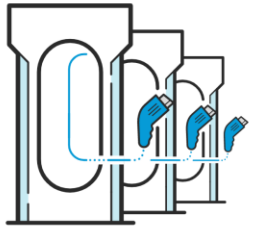
Resource	Details
ConEdison PowerReady Website	Incentive website including program information and resources.
PowerReady FAQs	Program Frequently Asked Questions.
Capacity Map/DAC Map	Look up your address on Con Edison capacity map.
Register – PowerReady Program Portal	Register for the PowerReady Program Portal.
Apply Now – PowerReady Program Portal	Apply for the PowerReady Program Portal.
PowerReady Program Portal Directions	Step by step directions to apply to the program.
Approved Contractor List	List of charger installers approved to participate in PowerReady.
Participant Guide	Includes program specifics, such as eligibility criteria and requirements.
EV Charging Cost Calculator	EV Charging cost calculator to determine bill impacts of charging.
EV Rates Webinar Replay	Video reviewing rate options for EV developers and customers.
EVMRP@coned.com	Reach out with any program questions or to start your project.

Lead the Charge!

Forecasts indicate EVs will be responsible for 1/3rd of all car sales by 2025



EV Drivers save over $500 and 72 lbs of CO_2 on average a year vs. gas drivers



Studies have shown EV charging stations at commercial sites increased average EV driver dwell time by 50 minutes

Con Edison Cleaning NYC's Air through Electric Vehicle Adoption

CUNY Summit

Contact us at evmrp@coned.com

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LOW-INCOME DER MAKE READY PROGRAM

March, 2024

Low-Income DER Make Ready Program

AGENDA

BACKGROUND

PROGRAM OVERVIEW

PROGRAM BENEFITS

PROGRAM CRITERIA

CONTACT

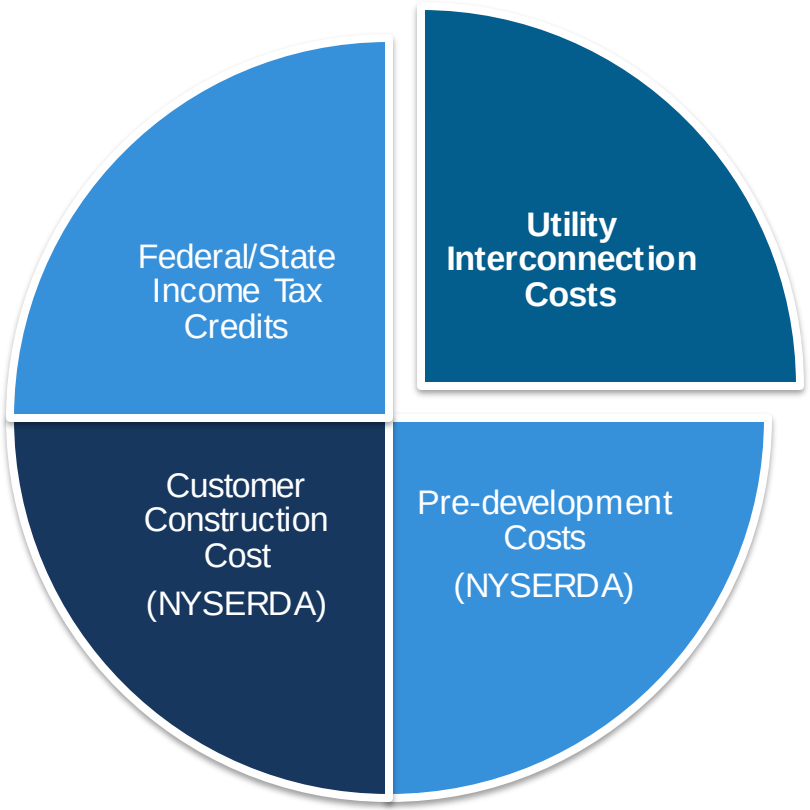
Low-Income DER Make Ready Program

BACKGROUND

Con Edison proposed a program to support interconnection of solar and/or storage for low-income customers via utility interconnection costs

During the rate case, Con Edison met with stakeholders to review program requirements and develop framework

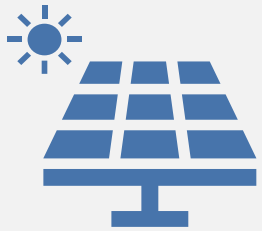
Required program follow-ups completed post rate case settlement for launch in 2024



Low-Income DER Make Ready Program

PROGRAM OVERVIEW

The Program seeks to support qualified projects by providing incentive support to cover all or a portion of utility upgrade costs as a credit for the installation of solar and/or storage distributed energy resources (“DER”) that benefit low-income customers.



Low-Income DER Make Ready Program

BACKGROUND

Capital Support

The Low-Income DER Make Ready Program support will be credited to project post-CESIR and scaled to the capacity of the DER being developed but capped at maximum dollar amount in three categories as listed in the table below.

Size	AC Nameplate Capacity	Maximum Capital Support
Small	51 kW – 499 kW	$150,000
Medium	500 kW – 999 kW	$300,000
Large	1 MW – 5 MW	$750,000

*Costs above the capital maximum are to be paid by the developer

Program funded at $22.95M through 2025

Additional Support

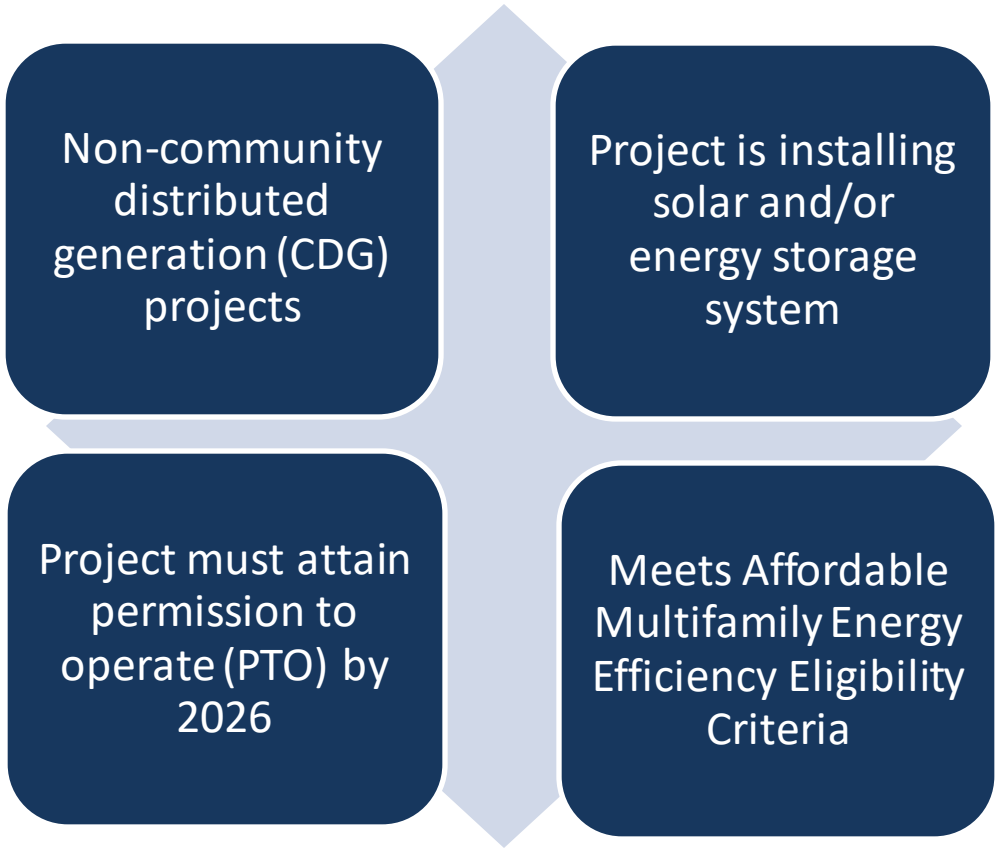
Upon approval for participation in the Low-Income DER Make Ready Program, the building will be referred to the following Programs where they may be eligible for additional support/incentive opportunities:

Referral
Con Edison Energy Efficiency teams Offers incentives for the installation of energy-efficient equipment and technology to reduce overall energy use and maintenance costs while increasing operating efficiencies and improving tenant comfort.
NYSERDA's Affordable Solar and Storage Predevelopment Technical Assistance Program Provides funding to address resource gaps and solve market barriers preventing the development of solar and energy storage installations benefiting low-to-moderate income (LMI) households.
NYC Accelerator Program Provides resources, training, and one-on-one expert guidance to help building owners and industry professionals improve energy efficiency and reduce carbon emissions from buildings in NYC.

Low-Income DER Make Ready Program

PROGRAM CRITERIA

A project is eligible for incentive support under the Program if it meets the following criteria:



Low-Income DER Make Ready Program

PROGRAM CRITERIA

The New York State Affordable Multifamily Energy Efficiency Program (AMEEP) is a combined effort of the Joint Utilities of New York and the New York State Energy Research and Development Authority (NYSERDA) to offer incentives for the installation of energy efficient equipment and technology to affordable multifamily buildings with five or more units.

Interested parties can email DERMakeReady@ConEd.com with proof of participation in one of the following AMEEP eligible programs to qualify for the Low-Income DER Make Ready Program.

US HUD, USDA-RD • & other Federally Regulated Affordable Housing	**DHCR** • Regulated Affordable Housing	**Low Income Housing Tax Credits**	**NYCHPD** • Regulated Affordable Housing (or other local housing agency)	**SONYMA Mortgage Insurance**
HFA 80/20 Program	**NYCHDC 80/20** • Mixed Income Programs	**Mitchell-Lama Buildings**	**Weatherization Assistance Program**	**Rent Roll** • Applies to affordable housing projects that do not meet the proxy requirements - properties must have a rent roll.

Low-Income DER Make Ready Program
CONTACT

- For more information, please email **DERMakeReady@ConEd.com** for more information
  - You may also reach out to Karice Redhead, Low-Income DER Make Ready Program Manager, at redheadk@coned.com

CUNY Solar and Storage Workshop

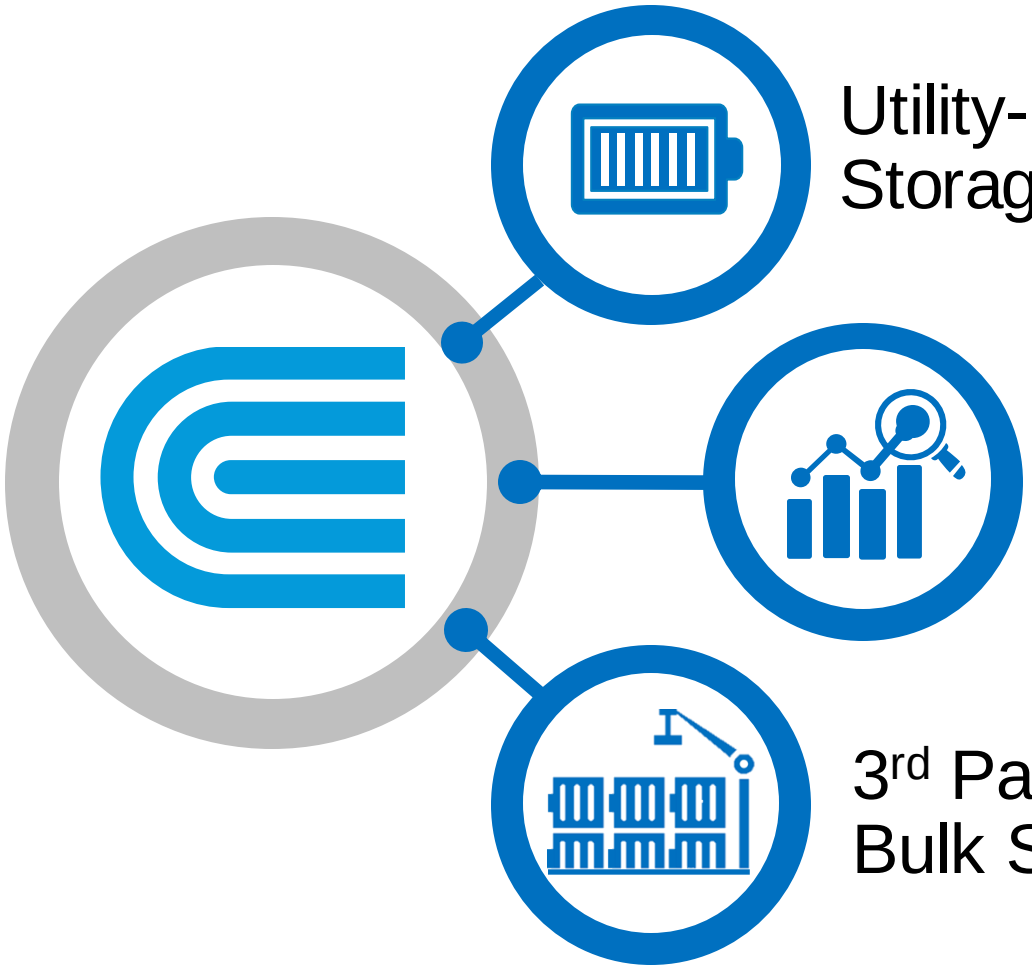
MARCH 20, 2024

conEdison

Storage

Con Edison Energy Storage Programs

A holistic approach to grid readiness



- Supports T&D Reliability
- Bridge Solution to Enable Electrification
- Supports Competitive 3rd Party Market Participation

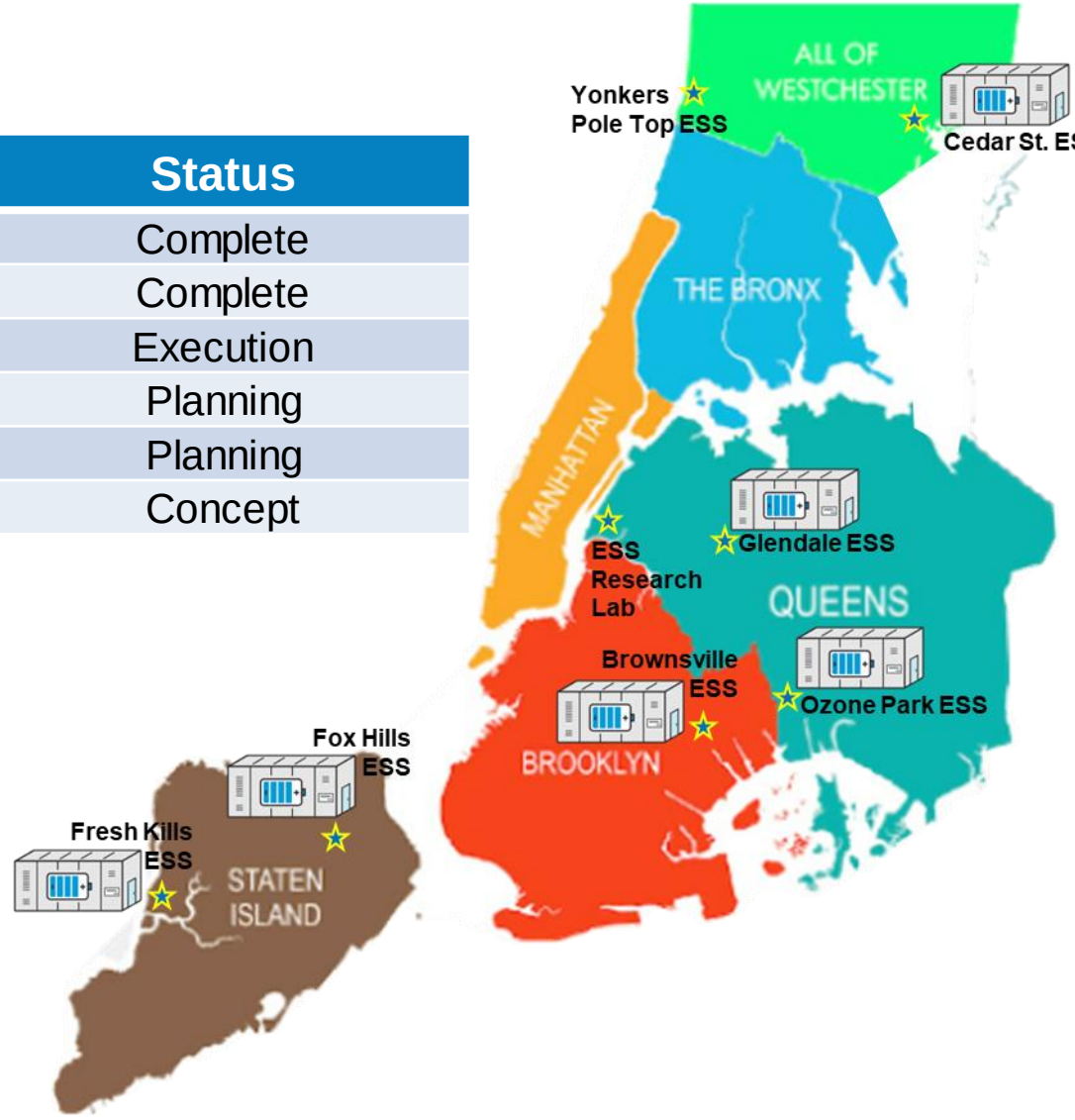
Storage
Utility Owned Program

-

Con Edison Utility Owned Storage

Energy Storage Projects - Overview

Project	Size	In Service Date	Status
Ozone Park	2.0 MW / 12.0 MWh	6/1/2018	Complete
Fox Hills Substation	7.5 MW / 30.0 MWh	8/27/2023	Complete
Brownsville Substation	5.8 MW / 23.2 MWh	6/2025	Execution
Fresh Kills Substation	11.6 MW / 46.4 MWh	2025 - 2026	Planning
Glendale Substation	5.8 MW / 23.2 MWh	2025 - 2026	Planning
Cedar St. Substation	4.0 MW / 16.0 MWh	TBD	Concept



Con Edison Utility Owned Storage

Fox Hills Distribution Substation

Benefits/Use Case

- Substation peak load capacity addition
- Ramp Support
- Market Opportunities

System Design

- 7.5 MW / 30 MWh
- HT Switchgear Design
- Tesla Mega Pack Storage
- Augmentation Ready

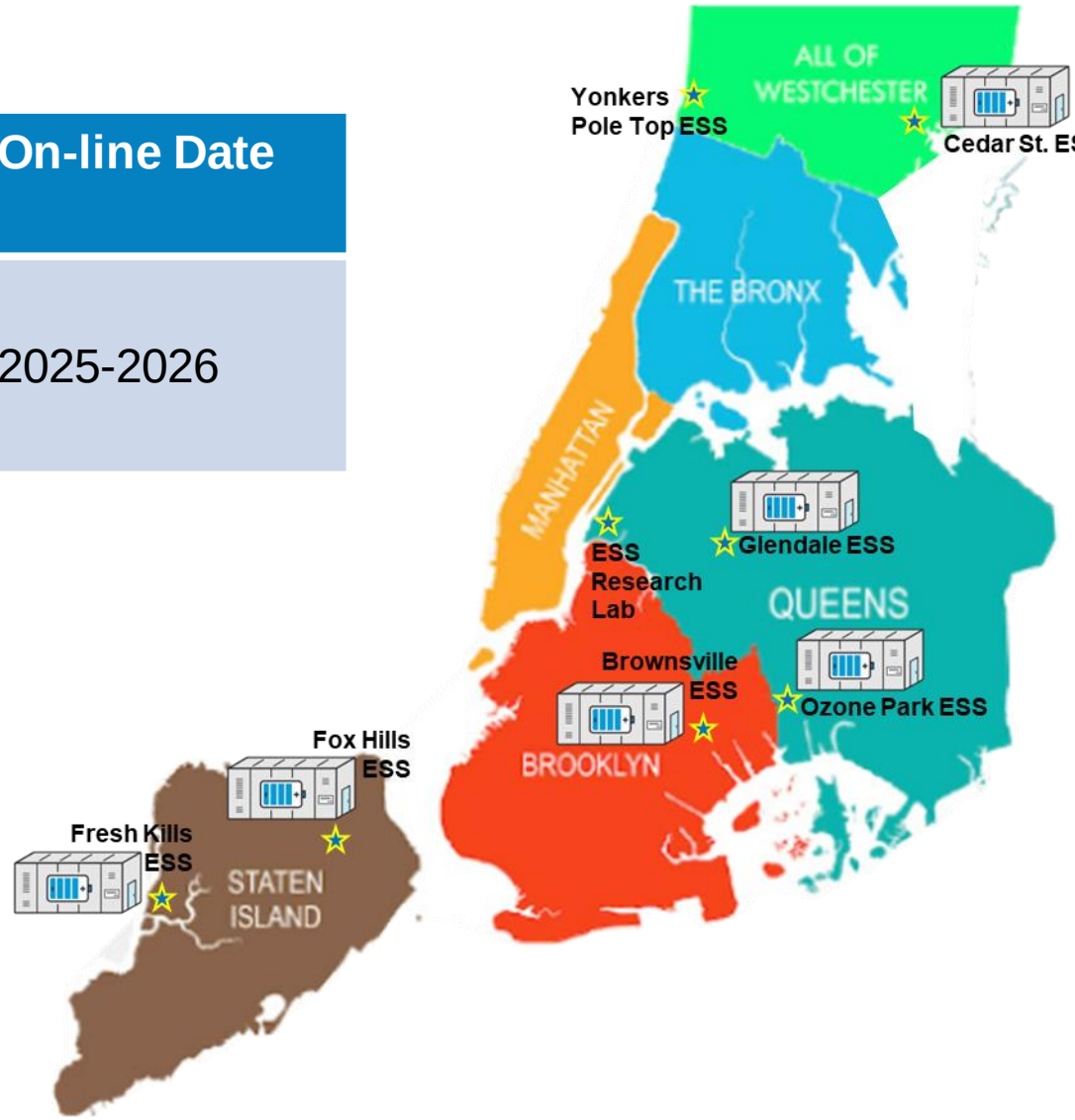
Fire Protection Systems

- First Line: Tesla integrated package
- Second line: Dry Type Deluge
- Advanced Technology: Thermal Mitigation System
- M&C: 24/7 Manned & Redundant

Con Edison Utility Owned Storage

Pole Top Mounted ESS - Pilot Overview

Project	Size	On-line Date
Distributed Pole Mounted ESS Yonkers, NY	(3) 30kW /165 kWh	2025-2026



Con Edison Utility Owned Storage

Pole Mounted ESS - Pilot Overview

Benefits/Use Case:
- Grid stabilization
- Voltage support
- Resiliency
- Market Opportunities

Project scope:
- 3 CECONY locations
- Test use cases

Installation Timeline:
- 2025: 1 Unit at R&D Lab
- 2025 - 2026: 3 Units in Yonkers

Storage
Bridge To Wires

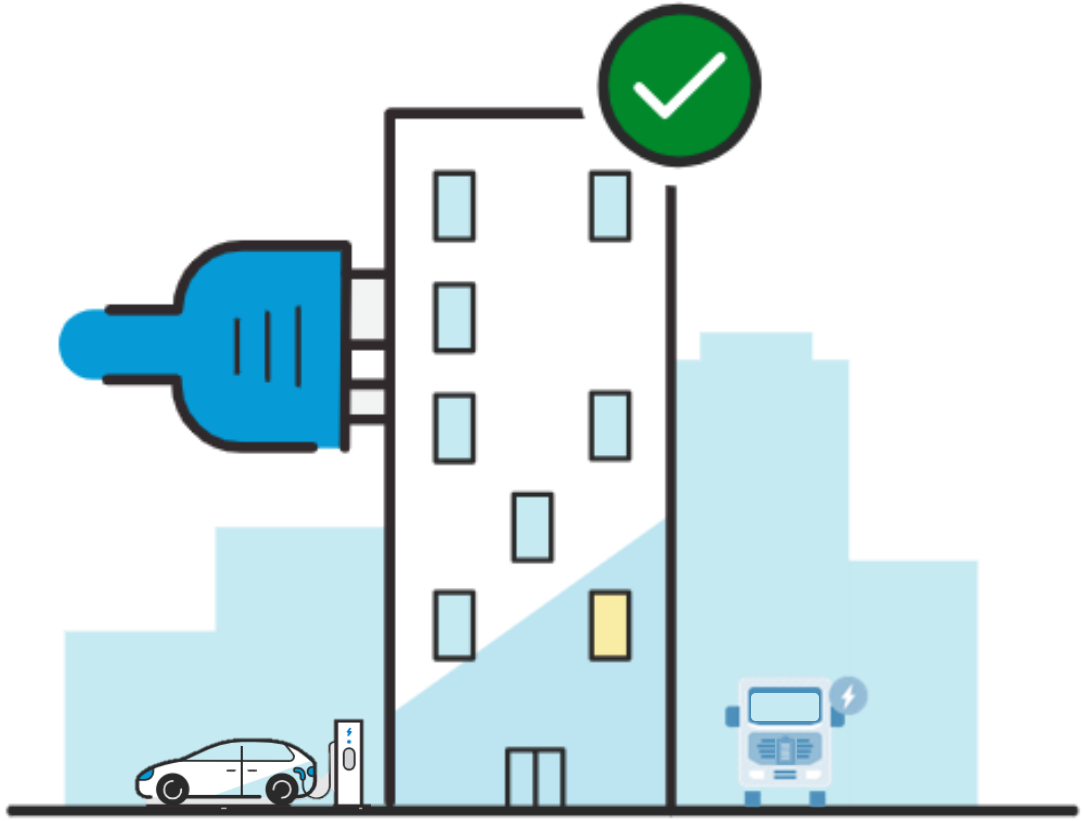
-

Con Edison Bridge to Wires*

Provides a temporary solution to enable electrification

Use Cases Enabled:

- Fleet electrification
- EV managed charging
- Building heat electrification



Benefits:

- Energy Storage System acts as bridge until long lead grid infrastructure can be built
- Energy Storage System moves to support other use cases after wires are built
- Wholesale market response reduces customer bill

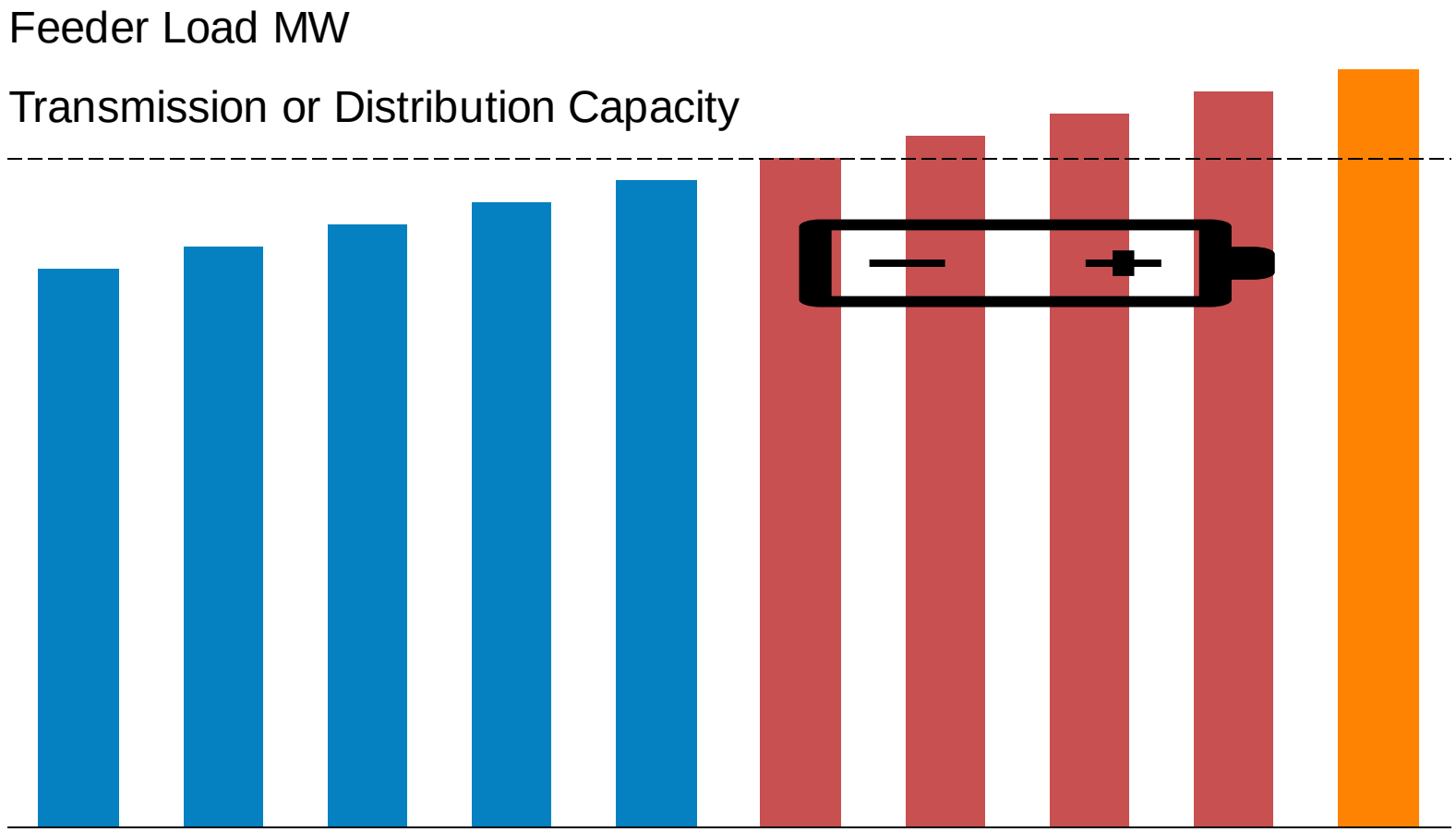
*Program Pending Regulator Approval

Basic Bridge to Wires Framework

Example: Transmission or Distribution Capacity constraint

Use case transition:

- Energy Storage System acts as bridge until long lead grid infrastructure can be built
- Energy Storage System moves to next use case: support hosting capacity, peak shaving, market participation
- Wholesale market response reduces customer bill impact



Storage
Bulk 3rd Party

-

Con Edison 3rd Party Bulk Procurement

The procurement buys the rights to dispatch storage systems

Generation

Traditional & Renewable generation continues to supply grid

Transmission

Distribution

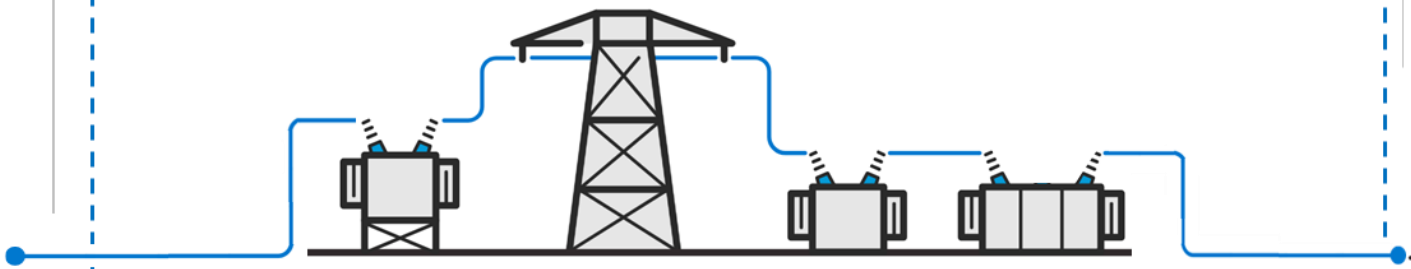
Competitive Bulk Purchases Provide:

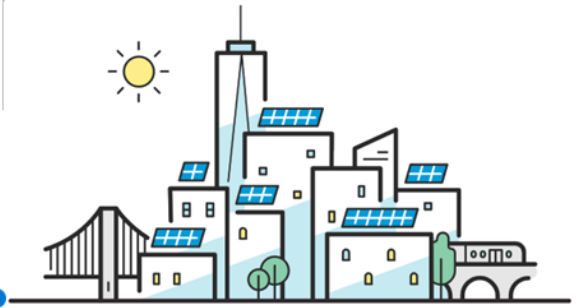
Peaking capacity support,
Energy arbitrage,
Voltage support,
Frequency regulation,
Renewable balancing

Infrastructure deferral,
Voltage support,
Avoided renewable curtailment,
Energy arbitrage,
Renewable balancing,

Customer

Demand charge reduction,
Reliability and back up,
Voltage support,
Electric vehicle charging,





CUNY Workshop: Enabling FERC 2222

William Taylor / Wassim Salloum
Distributed Resource Integration

March 20th, 2024

FERC Order 2222

Issued September 17th, 2020

Description

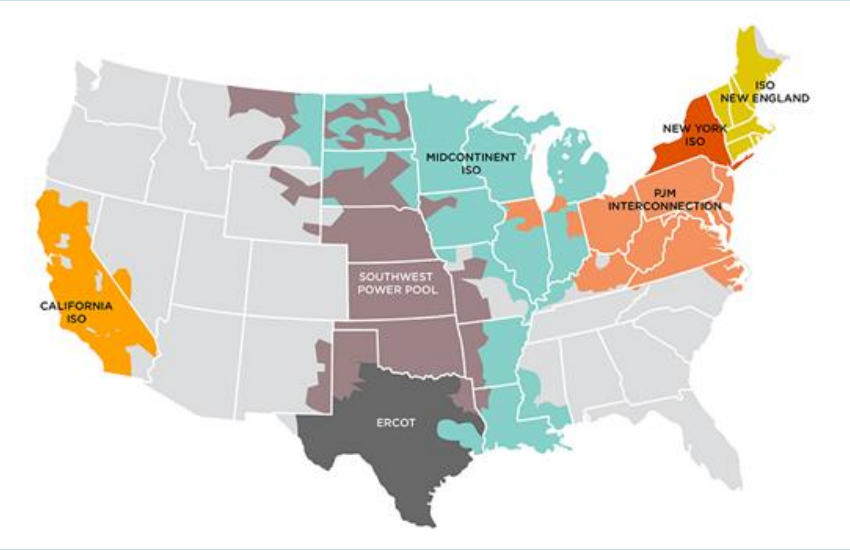
The Federal Energy Regulatory Commission (FERC or Commission) main goal is to better enable distributed energy resources (DERs) to participate in the electricity markets run by regional grid operators

Website: FERC ORDER 2222

ROI	Retail customers can now sell into the ISO wholesale electricity market
DER Types	Electric battery storage systems, rooftop solar panels, combined heat and power, energy efficiency measures, thermal energy storage systems such as or electric vehicles and their charging equipment
Size	Individual DERs 10kW and above can aggregate together to participate in the market NYISO has set its minimum aggregation size to 100 kW
Location	All DER in aggregation can be heterogenous and reside in the same Transmission Zone

Roadmap to FERC 2222

New York **Independent System Operator** (NYISO)



Federal Energy Regulatory Commission

2018
- FERC Order 841 – enabled ESR to participate in the wholesale market

2020
- FERC Approved NYISO's DER Aggregation Participation Model

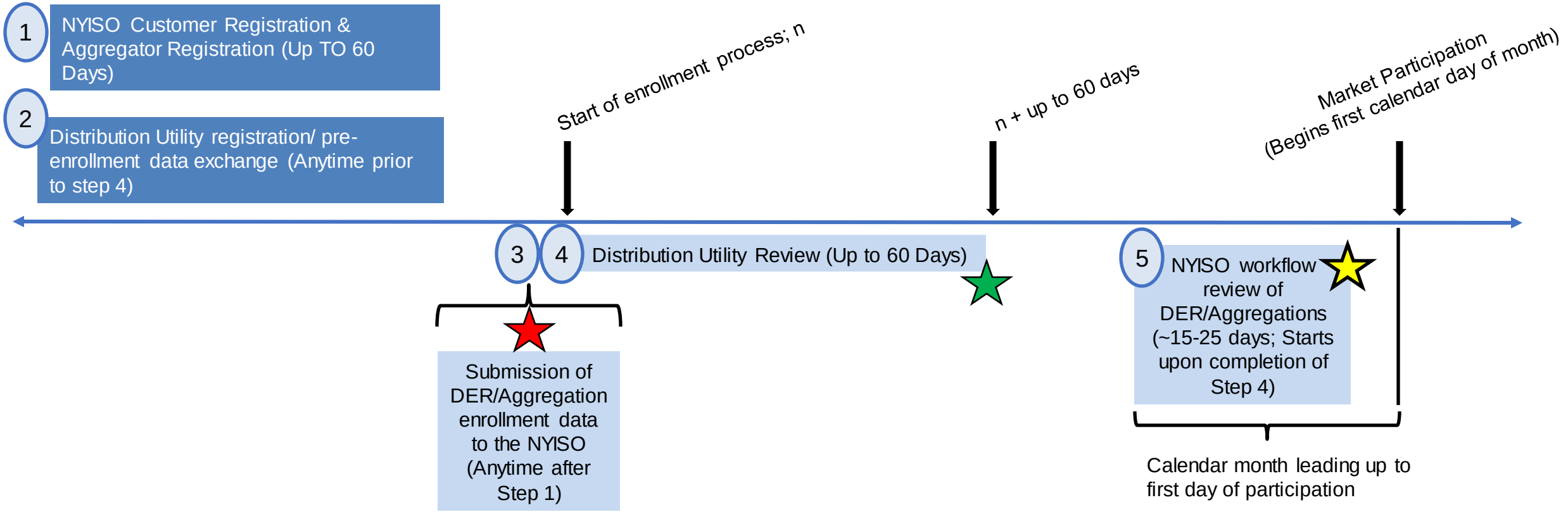
2023
- NYISO Aggregator registration opened in April for 2020 approved model

2024
- Enrollment scheduled to commence on April 16th
- Aggregator's earliest participation to occur in July

2026
- NYISO is scheduled be fully compliant with FERC Order 2222 by 12/31

NYISO Registration / Enrollment Timeline

NYISO DER Participation Model - Aggregator Registration and DER/Aggregation Enrollment Timeline



Distribution Utility Requirements

Overview

Description To Enroll in NYISO Aggregator Participation Model

Start Date **Start:** April 16th 2024

Resources Website Email

Eligibility and Requirements

Meter AMI or MV 90 - Interval meter (installed)

If a new meter is req., it has a lead time of 20 – 62 weeks based upon supply chain constraints

Agreement Each DER in the aggregation must already have an SIR / IA (**Demand Response** customers excluded)

Transmission Node Aggregator must submit the correct T-node for their aggregations

Telemetry Telemetry must be already established

Aggregator should be able to successfully receive and transmit telemetry to the applicable TO over their required protocols e.g., DNP, ICCP, SD-WAN, etc.

Discovery in the enrollment queue of any of these activities as unfulfilled, will trigger an immediate Attestation of Rejection (w/o proceeding through the rest of the enrollment checklist)

DERMS MVP Features

Technology developed to assist aggregators to register/enroll in wholesale market

Landing Page

View and download info on program participation

View list of existing Aggregators

Access Frequently Asked Questions

External Portal

Validate account status

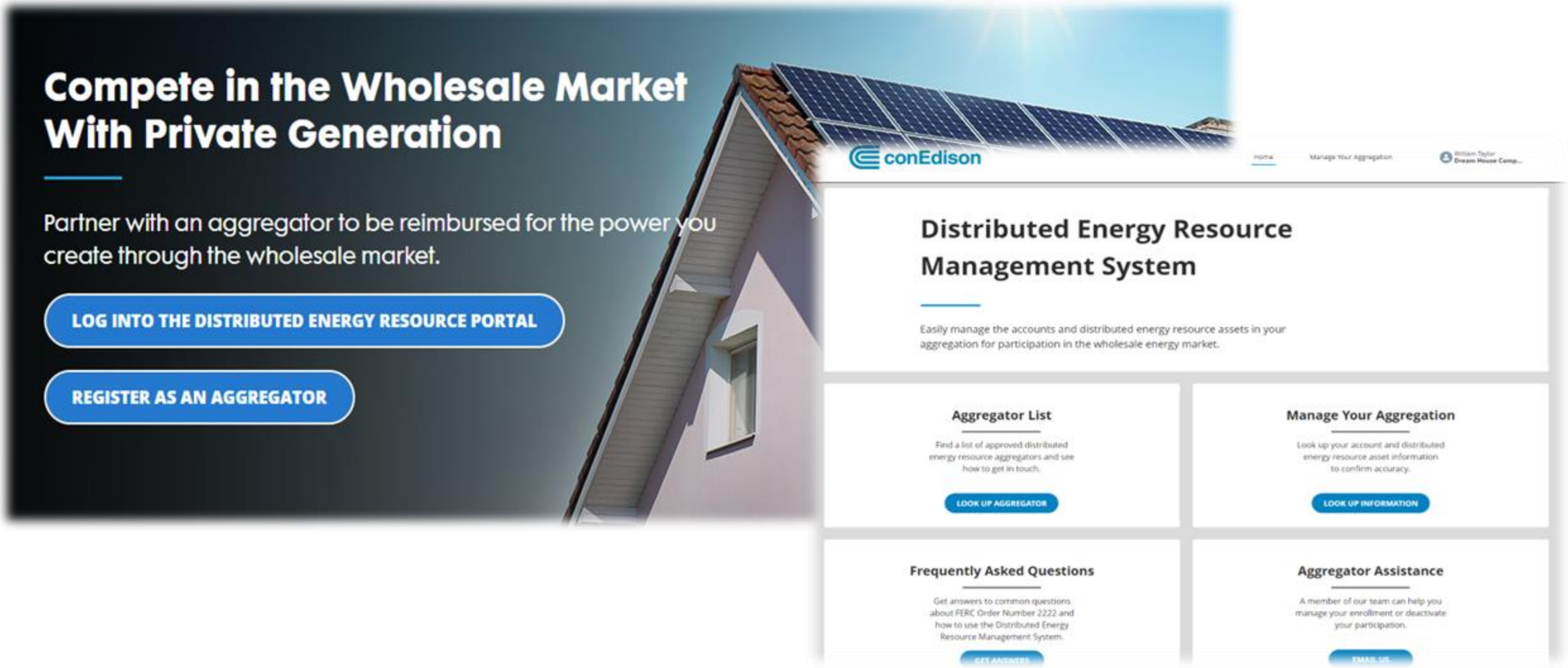
ViewTariff information and Transmission Node

View DER Asset information: Nameplate capacity, address, type, etc.

Internal Portal

Con Ed employees will manage communication with aggregators and NYISO to ensure they meet all the necessary requirements to participate in the Wholesale Market

Internal / External Portal



Telemetry Requirements

Direct Communication via DNP-3 over SDWAN

Six-second telemetry is required for each Aggregation

Aggregators are responsible for measuring four streams (channels) of telemetry data

The NYISO will send Aggregation its Base Point Signals

Distribution Utility Required Documents

Documents to be collected by the aggregator and provided to utility

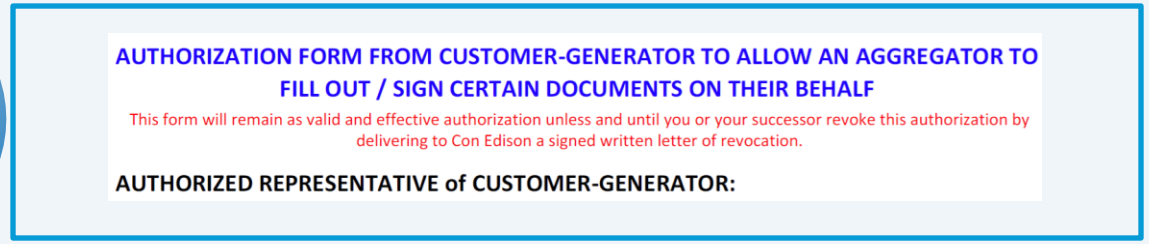
Description

An aggregator is responsible to receive authorization from DER customer to alter tariff and electric billing rate

The forms must be submitted to the utility prior to participating in the wholesale market

Website: Compete in the Wholesale Market

Letter of Authorization

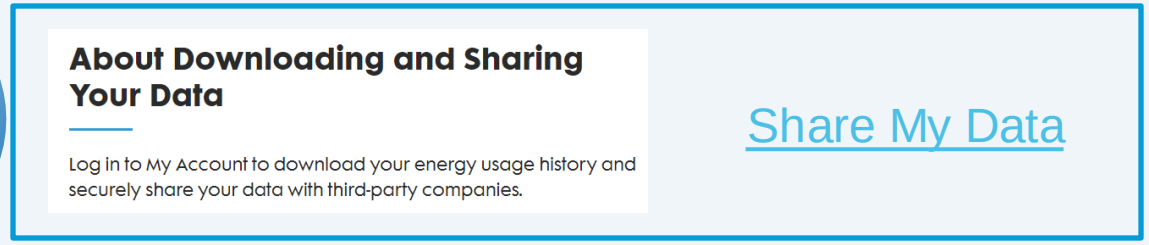


AUTHORIZATION FORM FROM CUSTOMER-GENERATOR TO ALLOW AN AGGREGATOR TO FILL OUT / SIGN CERTAIN DOCUMENTS ON THEIR BEHALF

This form will remain as valid and effective authorization unless and until you or your successor revoke this authorization by delivering to Con Edison a signed written letter of revocation.

AUTHORIZED REPRESENTATIVE of CUSTOMER-GENERATOR:

Green Button Connect

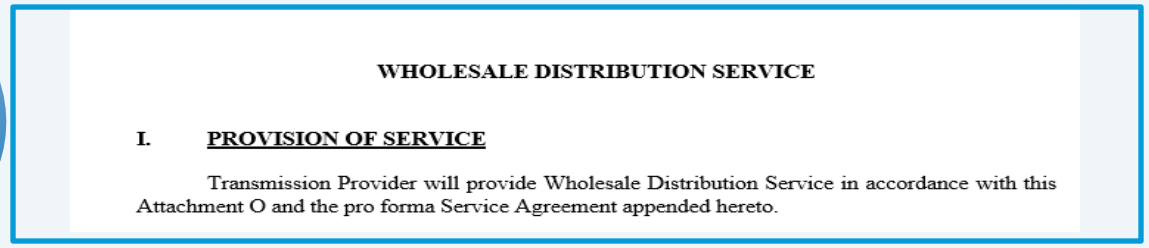


About Downloading and Sharing Your Data

Log in to My Account to download your energy usage history and securely share your data with third-party companies.

Share My Data

WDS Agreement

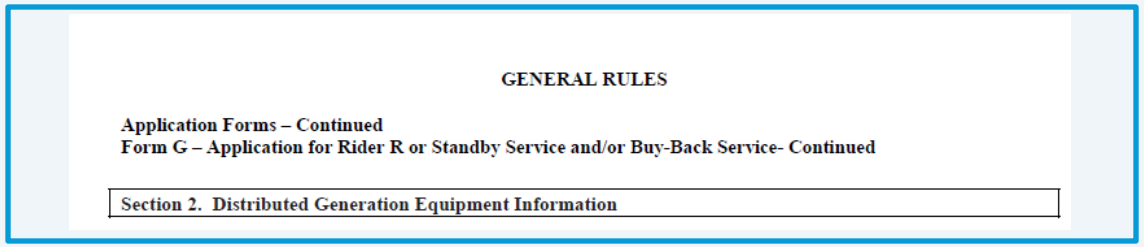


WHOLESALE DISTRIBUTION SERVICE

I. PROVISION OF SERVICE

Transmission Provider will provide Wholesale Distribution Service in accordance with this Attachment O and the pro forma Service Agreement appended hereto.

New Form G



GENERAL RULES

Application Forms – Continued
Form G – Application for Rider R or Standby Service and/or Buy-Back Service- Continued

Section 2. Distributed Generation Equipment Information

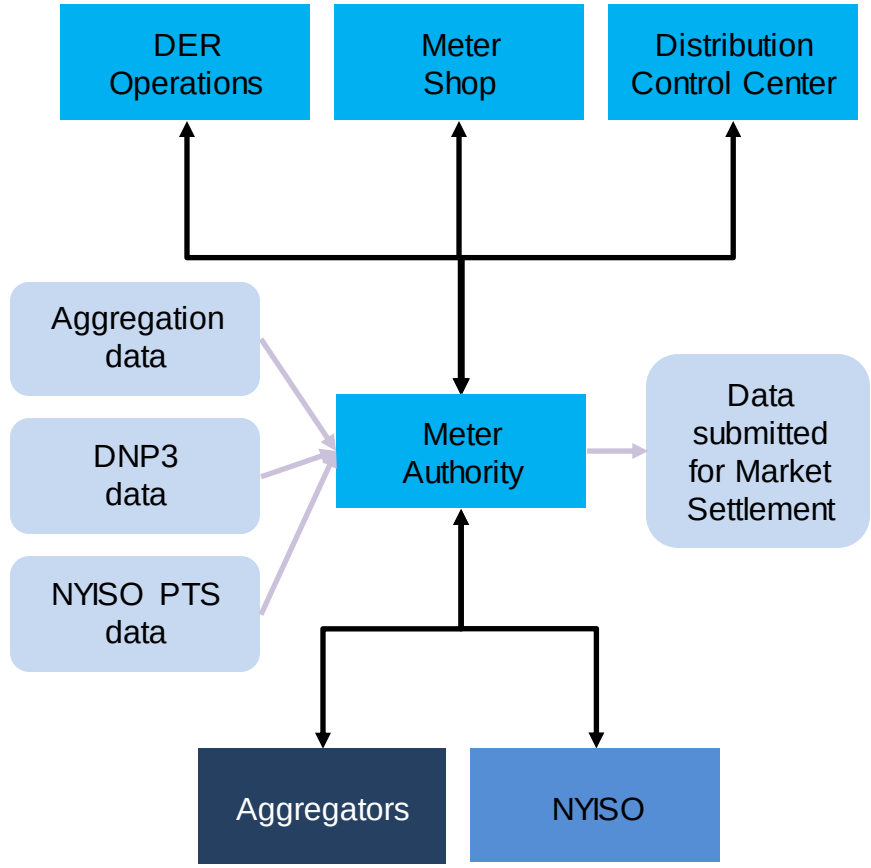
Settlement Process

The Meter Authority analysts review the data before submitting to NYSIO:

- Compare Aggregation data with Telemetry and NYISO PTS data
- Investigate and troubleshoot any discrepancies with relevant parties (Meter Shop, Control Centers, Aggregators, NYISO, etc.)
- Switch to alternate data source (e.g., telemetry) if necessary
- Submit best-available data to NYISO for previous day's market. Make open-period and monthly corrections for other days as needed

Align with existing process for Generators submissions as much as possible:

- Stick to 11:00 deadline --> May require overnight / automated workflow.
- Use the same vendor platform for all MA submissions, via new NYISO API



Best Practices - Interconnecting Energy Storage

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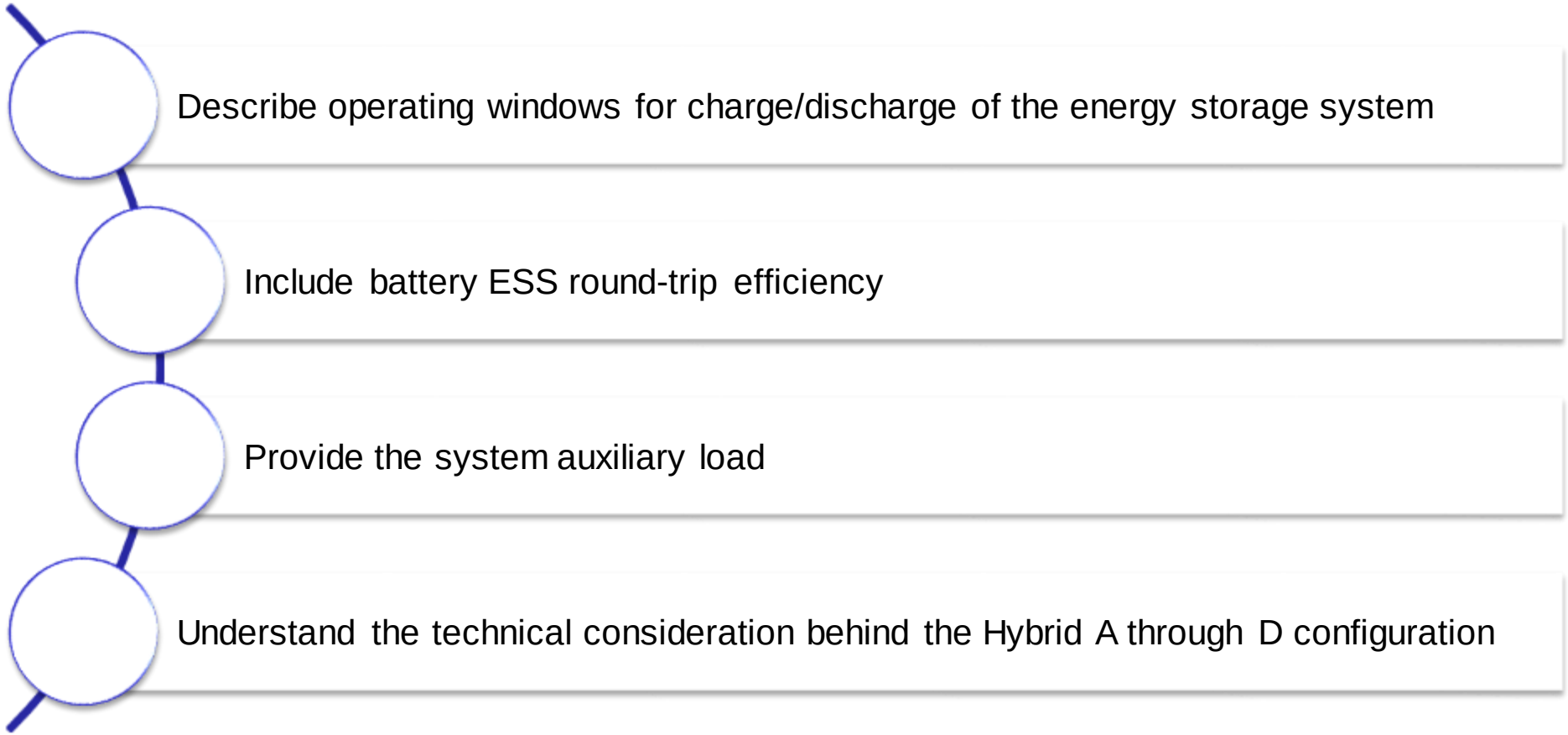
Appendix K Information

Increase communication and enhance alignment between developers and Con Edison

Addressing Common Themes



Critical Components in Appendix K

Scope of Work

- Input in Engineering CESIR technical analysis
- Critical components of the form
  - Scope of work
  - System auxiliary loads
  - Operational Characteristics
  - Hybrid Configuration - option A through D

Applicant Enters:

- HT or LT
- Export Rate
- BESS Capacity (RTE Included)
- Contingency Design
- DER technology type and nameplate
- System Configuration

Critical Components in Appendix K

System Auxiliary Loads

- Input in Engineering CESIR technical analysis
- Critical components of the form
  - Scope of work
  - System auxiliary loads
  - Operational Characteristics
  - Hybrid Configuration - option A through D

Applicant Enters:

- System Auxiliary Loads Description
- Size in kVA
- HVAC, alarms, lighting, communication equipment and etc.

Critical Components in Appendix K

Operational Characteristics

- Input in Engineering CESIR technical analysis
- Critical components of the form
  - Scope of work
  - System auxiliary loads
  - Operational Characteristics
  - Hybrid Configuration - option A through D

Applicant fills:

- Requested charging window
- Requested discharging window
- Making sure windows matching with the enrolled program(s) if any

Critical Components in Appendix K

Hybrid Configuration

- Input in Engineering CESIR technical analysis
- Critical components of the form
  - Scope of work
  - System auxiliary loads
  - Operational Characteristics
  - Hybrid Configuration - Option A through D

Applicant selects:

- Option A through D
- Note that the customer needs to prove the ESS is being charged by DG exclusively if Hybrid Option A is chosen. The system cannot be charged by the grid.
- Example: this is a Hybrid ESS proposal under Hybrid Option D (stand-alone system with no customer load).

CESIR Study

Contingent Design and Design Options

- To reduce interconnection costs, Con Ed will provide N-1 service design in a N-2 area.
- Any additional requested solution(s) will require additional 40-business-day extension to the CESIR.

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Electrification Capacity Map

Kathryn Osenni
Specialist, Distribution Planning

Con Edison's Hosting Capacity Maps

Hosting capacity of a distribution system refers to the amount of Distributed Energy Resources (DER) that can be accommodated without adversely impacting power quality or reliability under existing control configurations and without requiring infrastructure upgrades.

Main objectives of the hosting capacity maps:

- Provide increased transparency as to where Con Edison has hosting capacity.

- Provide developers, contractors, and customers visibility into potential DER locations and sites for private generation.

- To understand how and where DER installation impacts the distribution system.

These maps can be accessed through the **Con Edison Hosting Capacity Web Application.**

Electrification Capacity Map

Con Edison has renamed their Electric Vehicle Charging Capacity map to the Electrification Capacity map to account for the visualization of available hosting capacity for heat electrification, **in addition** to the visualization of available hosting capacity for potential electric vehicle charging sites.

This map shows **transformer capacity** data for Con Edison's underground network electrical system and **feeder-level capacity** data for Con Edison's non-network (overhead) system.

Methodology

This map displays both transformer and feeder level electrification capacity in both winter and summer.

Summer ratings are appropriate for use in estimating available capacity for electric vehicle charging.

Winter ratings can be used in combination with summer ratings to determine available capacity for building electrification.

Methodology

Seasonal hosting capacity varies based on equipment ratings, which increase in colder months, and based on seasonal peak load.

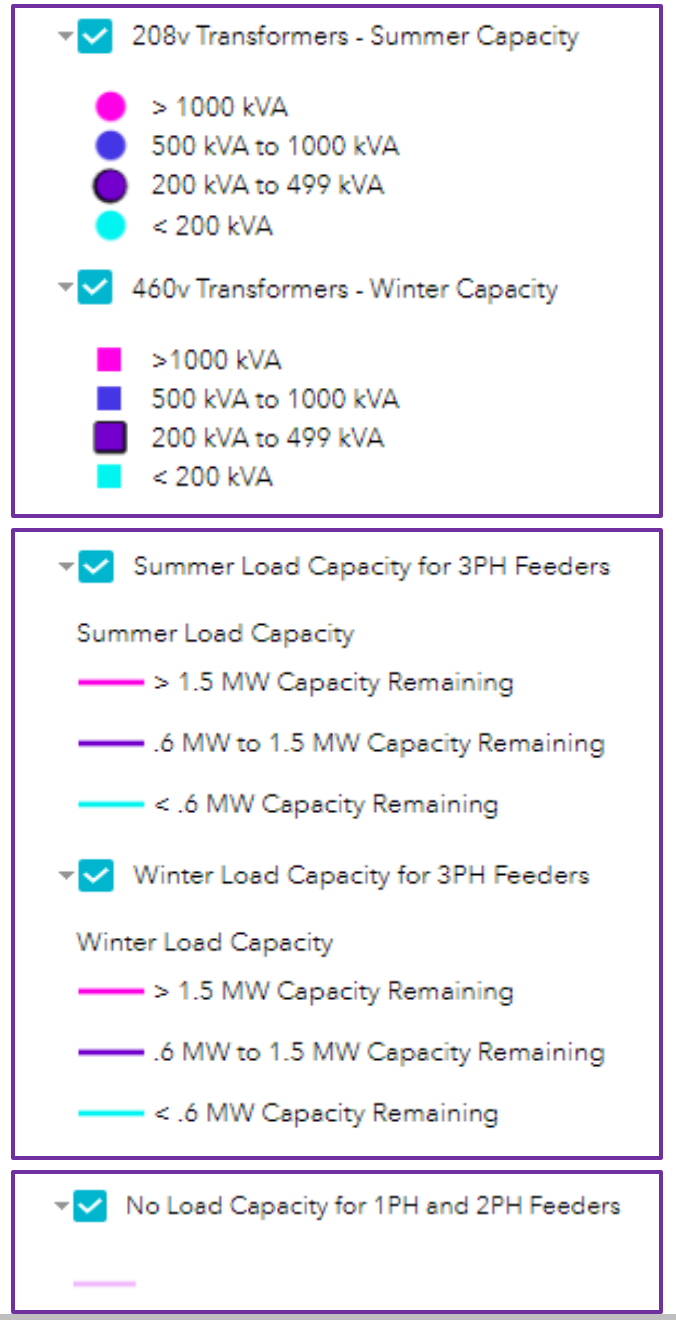
Transformers on this map are listed by available capacity and voltage.

Two types of transformers are displayed:

1. 208 volts (shown as circles)
2. 460 volts (shown as squares)

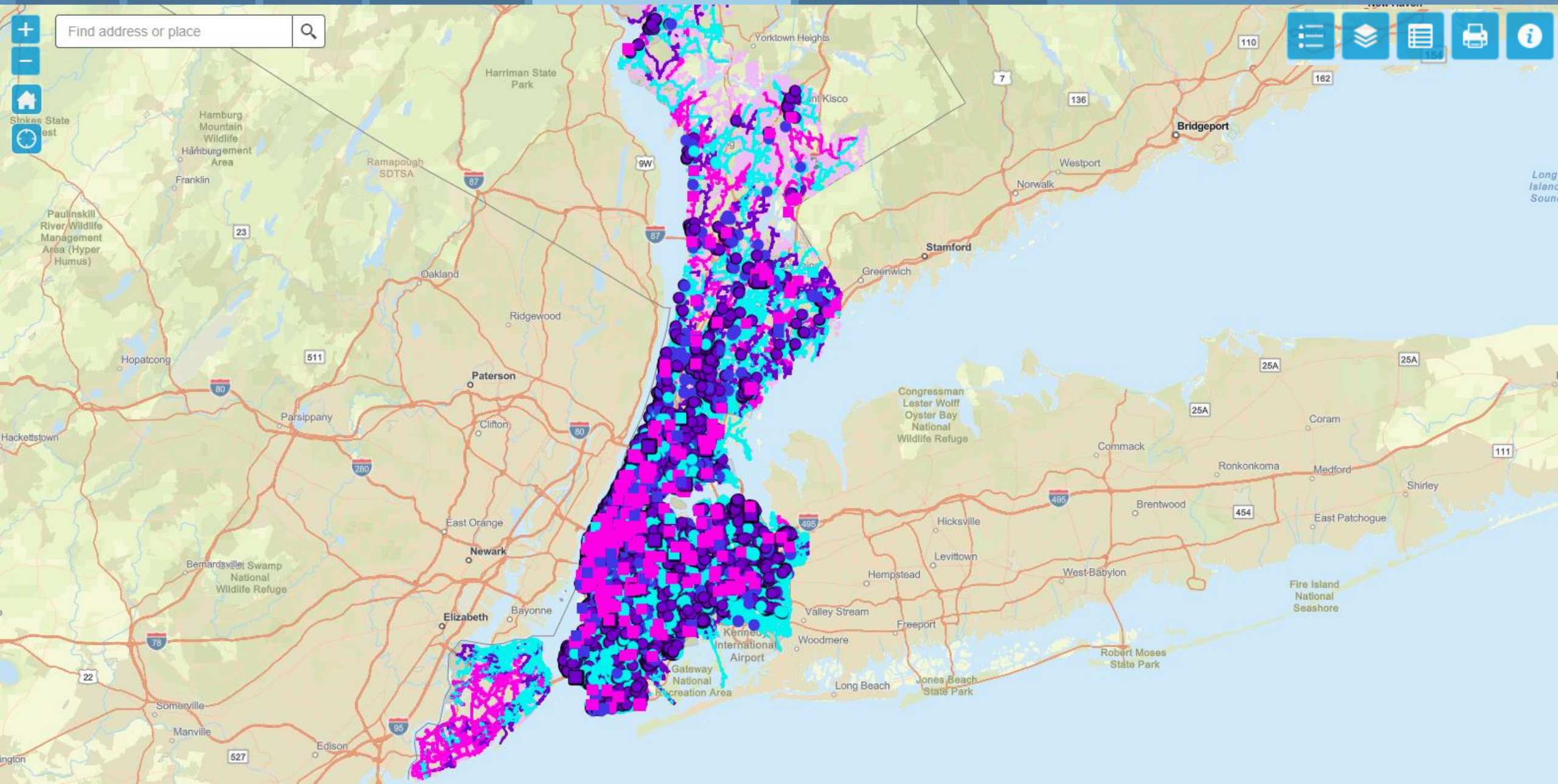
The map shows **four** levels of transformer capacity, by color.

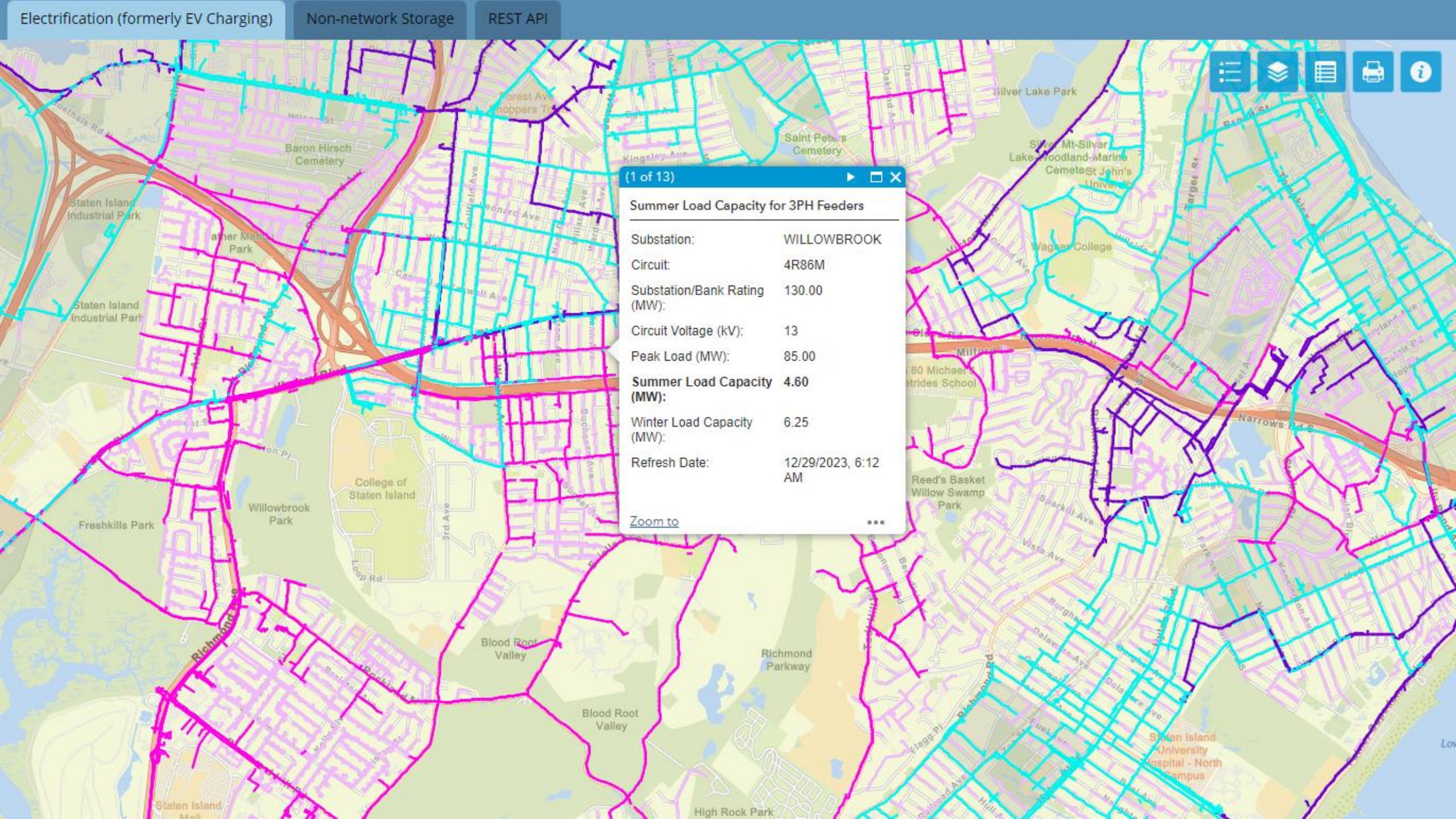
The map shows **three** levels of feeder capacity, by color.

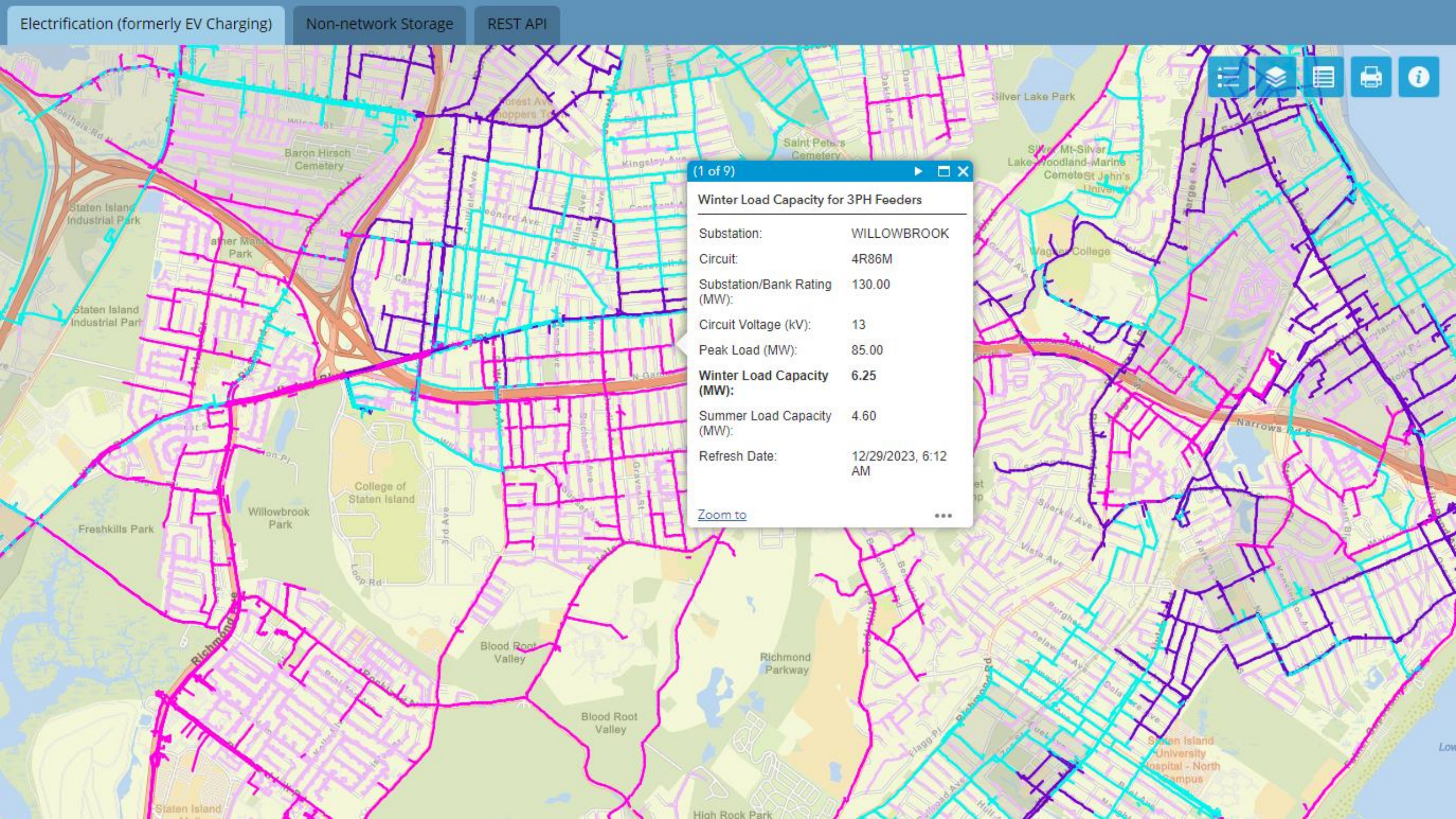


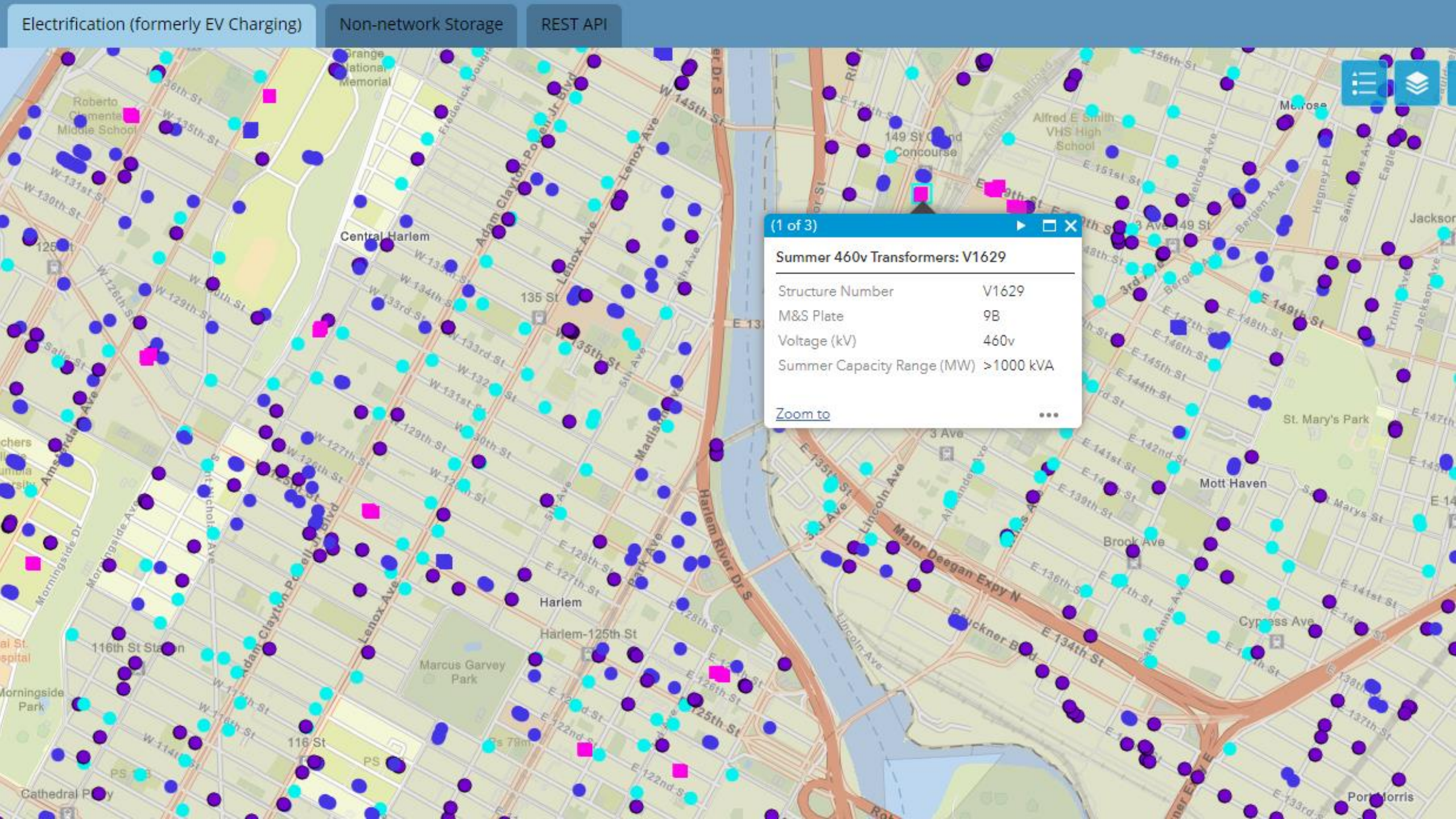
Con Edison Hosting Capacity Web Application

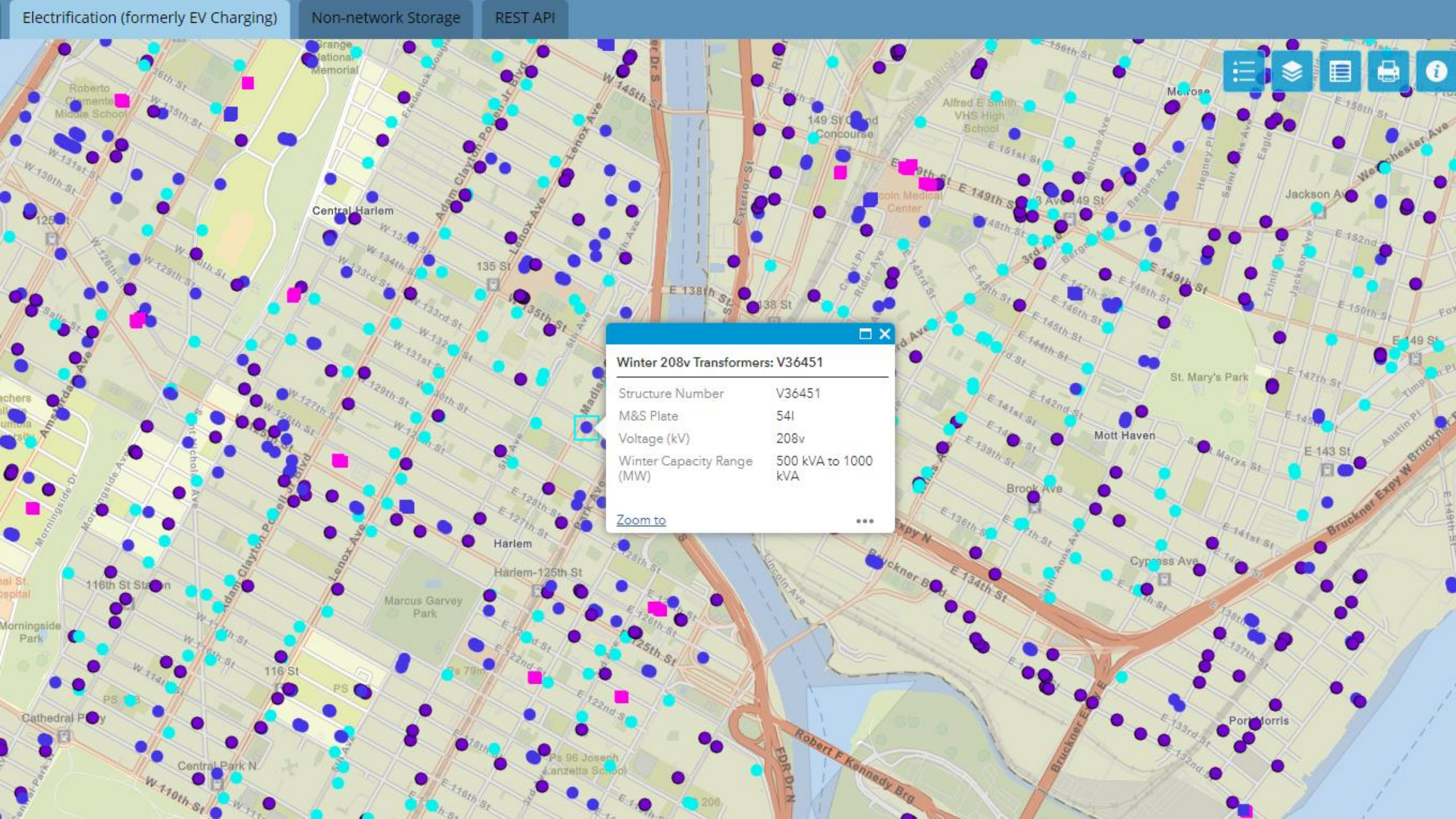
Introduction | Non-network PV | Network PV | Non-Wires Solutions | Electrification (formerly EV Charging) | Non-network Storage | REST API




Electrification (formerly EV Charging)
Non-network Storage
REST API
(1 of 13)
Summer Load Capacity for 3PH Feeders
Substation: WILLOWBROOK
Circuit: 4R86M
Substation/Bank Rating (MW): 130.00
Circuit Voltage (kV): 13
Peak Load (MW): 85.00
Summer Load Capacity (MW): 4.60
Winter Load Capacity (MW): 6.25
Refresh Date: 12/29/2023, 6:12 AM
Zoom to
Baron Hirsch Cemetery
Staten Island Industrial Park
Willowbrook Park
Freshkills Park
College of Staten Island
Blood Root Valley
Richmond Parkway
Reed's Basket Willow Swamp Park
Silver Lake Park
Wagner College
Narrows Rd S
Richmond Ave
Loop Rd
3rd Ave


Electrification (formerly EV Charging)
Non-network Storage
REST API
(1 of 9)
Winter Load Capacity for 3PH Feeders
Substation: WILLOWBROOK
Circuit: 4R86M
Substation/Bank Rating (MW): 130.00
Circuit Voltage (kV): 13
Peak Load (MW): 85.00
Winter Load Capacity (MW): 6.25
Summer Load Capacity (MW): 4.60
Refresh Date: 12/29/2023, 6:12 AM
Zoom to
Baron Hirsch Cemetery
Staten Island Industrial Park
College of Staten Island
Willowbrook Park
Freshkills Park
Blood Root Valley
Richmond Parkway
Silver Lake Park
Saint Peter's Cemetery
Narrows Rd S


Electrification (formerly EV Charging)
Non-network Storage
REST API
(1 of 3)
Summer 460v Transformers: V1629
Structure Number V1629
M&S Plate 9B
Voltage (kV) 460v
Summer Capacity Range (MW) >1000 kVA
Zoom to
Central Harlem
Harlem
Harlem-125th St
Mott Haven
Brook Ave
St. Mary's Park
Marcus Garvey Park
Major Deegan Expy N
E 134th St
Harlem River Dr S
Lenox Ave
Adam Clayton Powell Jr Blvd
Madison Ave
Park Ave
Lincoln Ave
Cypress Ave
Port Morris


Electrification (formerly EV Charging)
Non-network Storage
REST API
Winter 208v Transformers: V36451
Structure Number V36451
M&S Plate 54I
Voltage (kV) 208v
Winter Capacity Range (MW) 500 kVA to 1000 kVA
Zoom to
Central Harlem
Harlem
Harlem-125th St
Mott Haven
Port Morris
Marcus Garvey Park
St. Mary's Park
Morningside Park
Cathedral Pkwy
Central Park N
116th St Station
135 St
138 St
149 St Grand Concourse
Lincoln Medical Center
Alfred E Smith VHS High School
Roberto Clemente Middle School
Jackson Av
Brook Ave
Cypress Ave
Lenox Ave
Adam Clayton Powell Jr Blvd
Madison Ave
Park Ave
Exterior St
Bruckner Expy W
Bruckner Expy N
Bruckner Blvd
Robert F Kennedy Brg
FDR Dr N
E 134th St
E 138th St
E 149th St
E 143 St
W 145th St
W 125th St
W 110th St
116 St

Thank You!

dgexpert@coned.com